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HIGHWAY SAFETY LITERATURE

Concurrent with HRIS Abstracts

FALL 1982

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HIGHWAY SAFETY LITERATURE

Concurrent with HRIS Abstracts

FALL 1982

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TRANSPORTATION RESEARCH BOARD
NATIONAL RESEARCH COUNCIL
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HIGHWAY SAFETY LITERATURE
Fall Issue

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CONTENTS

FOREWORD iv

AVAILABILITY OF DOCUMENTS v

LOAN AND PHOTOCOPY SERVICES vi

FOREIGN LANGUAGE DOCUMENTS vii

ABBREVIATIONS viii

EXAMPLES OF ABSTRACTS ix

*ABSTRACTS OF RESEARCH REPORTS, TECHNICAL PAPERS IN CONFERENCE PROCEEDINGS, AND JOURNAL ARTICLES.................... 1

SOURCE INDEX 113

AUTHOR INDEX 120

RETRIEVAL TERM INDEX................. 126

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Documents published outside of the United States are usually written in the language of the country of origin and can be obtained from the publisher in that country. Documents published by the Organization for Economic Cooperation and Development (OECD) can be obtained at the following address:

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Translations may be obtained through agencies listed in the yellow pages of the telephone book in metropolitan areas, through embassies in Washington, D.C., from language departments of universities, or from one of the translations centers listed below. Some of these, such as the National Translations Center, do not translate but maintain a registry of translations. Fees for translation services vary but in the Washington, D.C., area average about $90 per page for technical material.

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ABBREVIATIONS OF AGENCY NAMES

CRIS	Current Research Information System, U.S. Department of Agriculture
DOT	Department of Transportation of the U.S.
ECMT	European Conference of Ministers of Transport
EI	Engineering Information, Inc.
ESL	Engineering Societies Library
FHWA	Federal Highway Administration, U.S. Department of Transportation
GPO	Government Printing Office of the U.S.
HRIS	Highway Research Information Service, Transportation Research Board
HSRI	Highway Safety Research Institute
HUD	Department of Housing and Urban Development of the U.S.
IOM	Institute of Medicine, National Academy of Sciences
IPR	Institute of Road Research, Brazil
IRF	International Road Federation
IRRD	International Road Research Documentation, Organization for Economic Co-operation and Development
ITS	Institute of Transportation Studies, University of California, Berkeley
NAS	National Academy of Sciences
NAE	National Academy of Engineering
NHTSA	National Highway Traffic Safety Administration, U.S. Department of Transportation
NRC	National Research Council, NAS-NAE
NTIS	National Technical Information Service
NUTCL	Northwestern University Transportation Center Library
OECD	Organization for Economic Cooperation and Development
OST	Office of the Secretary of Transportation, U.S. Department of Transportation
RTAC	Roads and Transportation Association of Canada
SAE	Society of Automotive Engineers
SRIS	Safety Research Information Service, National Safety Council
TRB	Transportation Research Board, National Academy of Sciences
TSC	Transportation Systems Center, U.S. Department of Transportation
TRRL	Transport and Road Research Laboratory of the United Kingdom
UITP	International Union of Public Transport
UMI	University Microfilms International
UMTA	Urban Mass Transportation Administration, U.S. Department of Transportation

OTHER ABBREVIATIONS

AD	a prefix for order numbers of documents available from NTIS
App	appendixes
Ed	edition
Fig	figures
FY	Fiscal Year
HS	a prefix for accession numbers of documents selected by NHTSA
Int	Interim
INTL	International
J	Journal
No	Number
Off	Office
p	page or pages
PB	a prefix for order numbers of documents available from NTIS
PC	paper copy of the original document
Phot	photographs
pp	pages
P.O.	Post Office
Ref	references
Repr	reproduction
Res	Research
RP	Repository
Rpt	Report
Tab	tables
U.S.	United States
Vol	Volume

EXAMPLES OF ABSTRACTS

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RESEARCH REPORT

TRIS Accession Number	**318981**
Title	**DRUG RESEARCH METHODOLOGY. VOLUME I. THE ALCOHOL-HIGHWAY SAFETY EXPERIENCE AND ITS APPLICABILITY TO OTHER DRUGS**
Abstract	The report presents the findings of a workshop concerning the alcohol and highway safety experience, which includes research efforts to define the drinking-driving problem and societal responses to reduce the increased highway safety risk attributable to alcohol. A cross-disciplinary panel of experts examined its history, methodologies employed in research, and approaches to the development and implementation of preventive measures (countermeasures). From these discussions a conceptual framework for use in comparing alcohol and other drugs was developed. Categories include (1) the process of risk identification; (2) measures of risk to indicate impaired driving ability; and (3) approaches to preventive measures that reduce the increased highway safety risk attributable to alcohol and other drugs. The report summarizes comparisons between alcohol and other drugs.
Authors, Publication Data, Document Data, HS Number	Donelson, AC Marks, ME Jones, RK Joscelyn, KB Highway Safety Research Institute, National Highway Traffic Safety Administration Final Rpt. UM-HSRI-80-17, HS-805 374, Mar. 1980, 74p, 39 Ref. Volume 2 is HS-805 299; Volume 3 is HS-805 375; Volume 4 is HS-805 485; and Volume 5 is HS-805 462. See also HS-803 879 and HS-805 461.
Contract Number	Contract DOT-HS-7-01530
Information Source	ACKNOWLEDGMENT: NTIS
Availability	ORDER FROM: NTIS
Document Order Data	PB80-223522

JOURNAL ARTICLE

TRIS Accession Number	**319845**
Title	**BICYCLING INJURIES**
Abstract	The increase in the use of bicycles has been paralleled by an increase in bicycle accidents. Safety education programs, especially for young people, might reduce the number of injuries. (A)
Authors, Publication Data, Document Data, HS Number	Davis, MW Litman, T Crenshaw, RW Mueller, JK *Physician and Sports medicine* Vol. 8 No. 5, HS-032 426, May 1980, pp 88-96, 4 Tab., 2 Phot., 14 Ref.
TRB Information Source	ACKNOWLEDGMENT: National Safety Council, Safety Research Info Serv (800428J)
Availability	ORDER FROM: McGraw-Hill, Incorporated, 1221 Avenue of the Americas, New York, New York, 10020

ABSTRACTS OF RESEARCH REPORTS, TECHNICAL PAPERS IN CONFERENCE PROCEEDINGS, AND JOURNAL ARTICLES

132132

STATEWIDE HIGHWAY SAFETY PROGRAM ASSESSMENT--A NATIONAL ESTIMATE OF PERFORMANCE

The Nation spent $4 billion last year for traffic and highway safety. The problems are well known--normally over 50,000 fatalities and over 4 million injuries annually. The need for a National safety mission is clear. With this direction in mind, the current Assessment examines how safety funds were used from 1969 through 1974, and what was produced nationwide. In the ensuing chapters, we will examine the following: highway safety program operational outputs; state/local expenditures and Federal 402 funds which were used to achieve program results; program performance trends--how their growth matched growth in highway risks, as well as social and economic factors which point the way for program decisions. The analysis was constructed around key indicators of performance which were considered useful to produce national findings. Performance is a word essentially defined by other words: accomplishments, what was done, outputs, efficiency and productivity. For a better meaning there are examples in the study, such as the number of citations for traffic violations, traffic-related ambulance responses, presentence investigations, the cost per unit for these actions, and the trends of these and other indicators over a six-year period compared with the number of drivers and vehicles on the road, their miles of travel, and associated factors.

National Highway Traffic Safety Administration HS-805 023U, July 1975, 153p, Figs., Tabs., 1 Ref.

Reference copy only available National Highway Traffic Safety Administration.

ACKNOWLEDGMENT: Highway Safety Research Institute (HSRI-33058)
ORDER FROM: National Highway Traffic Safety Administration, 400 7th Street, SW, Washington, D.C., 20590

197699

SOUTH DAKOTA: ASAP ANALYTIC STUDY NO. 1-1977. AN ANALYSIS OF TOTAL PROJECT IMPACT

The study analyzes the effects of ASAP on alcohol related traffic accidents. Week-long series of hourly observations were created by summing successive two-year segments of traffic accident records. The resulting series were decomposed via a harmonic analysis into frequency components that represented the time paths of the seven daily cycles. The results of baseline/project period comparisons indicated that the South Dakota ASAP caused a small, temporary reduction in alcohol related (AR) crashes, and in light of rather large increases in AR crashes following project termination, probably maintained a dampening effect throughout the project period. The results of the frequency component analysis were supported by visual inspection of changes in the monthly series of selected subsets of injury and fatal crashes that served as proxy measures for alcohol related crashes.

Krause, PB
South Dakota University, Vermillion, South Dakota Alcohol Safety Action Project, National Highway Traffic Safety Administration Final Rpt. HFL-77-5, HS-803 843, July 1977, 60p, 4 Ref.

Prepared in cooperation with South Dakota Alcohol Safety Action Project, Pierre. See also HS-803 845, TRIS 197709.
Contract

DOT-HS-6-01416

ACKNOWLEDGMENT: NTIS
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PB-295758/7ST

197709

SOUTH DAKOTA (SD): ALCOHOL SAFETY ACTION PROJECT (ASAP) ANALYTIC STUDY NO 5/6-1977, AN ANALYSIS OF ALCOHOL REHABILITATION EFFORTS

The study examines the efficacy of problem drinker driver rehabilitation as a viable addition, or alternative, to traditional court punitive sanctions for driving while intoxicated. Two groups of clients were analyzed in a control group versus treatment group experimental design. The first group were regular SD:ASAP clients who were randomly assigned to treatment or control after January, 1974. The second group was a subset of SD:ASAP clients who became part of the national Short Term Rehabilitation (STR) study. The treatment outcome measures were the traditional DWI recidivism, analyzed with a survival rate methodology, and the recently developed questionnaire/interview scale scores measuring certain aspects of life activity. The recidivism comparisons were based on cohorts of clients formed quarterly with a follow-up period of 15 quarters. No evidence was found to suggest that rehabilitation made any difference in post-treatment drunk driving behavior.

Krause, PB Olshan, MD
South Dakota University, Vermillion, National Highway Traffic Safety Administration Final Rpt. HFL-77-10, HS-803 845, Sept. 1977, 124p, 7 Ref.

See also HS-803 843, TRIS 197699.
Contract

DOT-HS-6-01416

ACKNOWLEDGMENT: NTIS
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302437

BLUEPRINT OF AN ANALYSIS OF THE PEDESTRIAN'S TASK: PART 1, METHOD OF ANALYSIS

Within the framework of the child traffic education project a preliminary version (blueprint) of a pedestrian task analysis was developed. The objective of the analysis is to serve as an aid for the formulation of educational objectives and for the systematic ordering of empirical data concerning factual task performance and the relevant psychological abilities. The method followed in the analysis is described in part 1 of the report. By means of a behaviour-requirement analysis 26 pedestrian tasks were formulated whereby the behaviours and psychological processes are described which are considered necessary for an adequate (safe) task performance. A full description of all tasks is added as an appendix. /TRRL/

Molen, HH van der Rothengatter, JA Vinje, MP
Groningen University, Netherlands Monograph VK7, HS-032 427, 1978, 30 p., 5 Fig., 23 Ref.

Also printed in Accident Analysis and Prevention, Volume 13 Number 3, pages 175-191, September 1981 issue.

ACKNOWLEDGMENT: TRRL (IRRD 241907), Institute for Road Safety Research
ORDER FROM: Groningen University, Netherlands, Traffic Research Centre, P.O. Box 14, 9750 AA Haren, Netherlands

309861

THE EFFECT OF SEAT BELTS ON MINOR AND SEVERE INJURIES MEASURED ON THE ABBREVIATED INJURY SCALE

This report examines the effect of seat belt wearing on both minor and severe injuries. It concludes that the wearing of static three-point lap/sash belts by front outboard seat occupants of cars and car derivatives is associated with: (a) reduced likelihood of severe-to-fatal injury to the head-face, thorax, lower torso and lower extremities when injured and not ejected in crashes in built-up areas and, for some body regions, in open road crashes, (b) increased likelihood of minor injury to the thorax and lower torso when injured and not ejected in crashes in all locations and of minor injury to the neck (ie, whiplash) when injured and not ejected in crashes in built-up areas. There are suggestions that the increased likelihoods of the minor injuries are not artefacts of the injury criterion for inclusion, nor of the reduced likelihood of severe injury to the trunk when seat belts are worn, but are due to the wearing of the seat belt. The absence of crash severity information in the survey data prevented a definitive evaluation of the effect of seat belt wearing alone on the injuries of car occupant casualties (A). (TRRL)

Cameron, MH (Cameron (MH) and Associates)
Australia Department of Transport   Monograph   Rpt. No. CR4, HS-032 482, Mar. 1979, 44 p., 18 Tab., 6 Ref.

Acknowledgment: TRRL (IRRD 239519)
Order From: Australian Department of Transport, Office of Road Safety, G.P.O. Box 1839, Melbourne, Victoria, Australia

314063

SPECIAL ADJUDICATION FOR ENFORCEMENT (SAFE). VOLUME I KING COUNTY DISTRICT COURTS, SEATTLE, WASHINGTON

The King County District Courts Special Adjudication for Enforcement (SAFE) Project was designed to demonstrate the feasibility of using informal parajudicial hearings for adjudication of non-mandatory moving traffic violations (those offenses not requiring mandatory appearance in court based on the seriousness). The SAFE procedures, which are now integrated into District Court operations, were intended to simplify the administrative tasks associated with the traditional arraignment/trial process and eliminate one required personal appearance of persons wishing to contest their charges. Informal hearings, in which defendants can explain their side of the matter, are conducted by magistrates (practicing attorneys). Magistrates can accept guilty pleas, reduce and/or suspend fines, and, in extreme situations, dismiss cases. If the defendant is adamant about his/her not guilty plea, a trial is set (bypassing the formal arraignment). The program emphasizes referrals to driver educational programs and is oriented toward driver improvement. The use of SAFE hearings and procedures during the demonstration period allowed the District Courts system to deal with an increasing number of traffic filings without a significant increase in staff, and is projected to result in reductions of approximately 34,000 arraignments and 7,000 trials in 1979.

Arnold, D   Fleissner, D
Washington State Off of the Admin for the Courts, National Highway Traffic Safety Administration   Annual Rpt   HS-805 305, Mar. 1979, 97p, 16 Ref.

See also Executive Summary, PB80-179864 and Volume 2, PB80-179880. Report on King County District Courts. Also available in set of 3 reports PC E08, PB80-179856.
Contract

DOT-HS-343-3-682

Acknowledgment: NTIS
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PB80-179872

318413

COST EVALUATION FOR NINE FEDERAL MOTOR VEHICLE STANDARDS. VOLUME VI: FMVSS 220 (SCHOOL BUS, ROLLOVER PROTECTION), 221 (SCHOOL BUS, JOINT STRENGTH), 222 (SCHOOL BUS, SEATING AND CRASH PROTECTION)

Total consumer out-of-pocket costs have been estimated for three school bus Federal Motor Vehicle Safety Standards. These are the FMVSS 220 Rollover Protection, FMVSS 221 Body Joint Strength, and FMVSS 222 Seating and Crash Protection. From a list of eight major school bus body builders, three were selected for plant visits. The manufacturers representatives were questioned as to the extent of design, material, production, and personnel changes required to meet each standard. A plant inspection tour was made and the types of buses produced and the rates of production were established. The general findings as to the changes in design and production required to meet the new standards were: FMVSS 220--No change; FMVSS 221--Adhesive added to body joints; and FMVSS 222--Seats strengthened, padding added, front barriers added, seat belts added to under 10,000 pound vehicles. The typical variable profit of the manufacturer was established as was an average dealer's discount. The average costs of complying with the standards were established as: FMVSS 220--No cost; FMVSS 221--$242.37; and FMVSS 222--$784.72 (over 10,000 pounds GVWR)--$249.92 (under 10,000 pounds GVWR).

Harvey, MR   Lesczhik, JA   McLean, RF
De Lorean Motor Company, National Highway Traffic Safety Administration   Final Rpt.   HS-805 320, Nov. 1979, 59p, 1 Ref.

See also Volume 5, PB80-196249. Also available in set of 6 reports PC E15, PB80-196199.
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DOT-HS-8-02015

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PB80-196256

318905

IMPROVEMENT OF MATHEMATICAL MODELS FOR SIMULATION OF VEHICLE HANDLING. VOLUME 1. USER'S GUIDE FOR THE FIVE DEGREE OF FREEDOM MODELS

This report is composed of seven volumes: Volume 1--User's Guide for the Five Degree of Freedom Models, which contains directions on how to operate the digital programs SLABAM and SLABIM; Volume 2--Programmers' Guide for the Five Degree of Freedom Models, which is intended to provide sufficient documentation on the SLABAM and SLABIM programs as to enable them to be alltered readily; Volume 3--Technical Mannual for the Five Degree of Freedom Models, which contains information on model validation and operating costs as well as samples and analyses of simulation output; Volume 4--Users' Guide for the General Simulation; Volume 6--Programmers' Guide for the Driver Module, which is intended to provide sufficient documentation on the DRIVER MODULE as to enable it to be altered readily if necessary; Volume 7--Technical Manual for the General Simulation, which contains mathematical modelling of the vehicle and the human driver as well as differences between the APL simulation and the current one; and Volume 8--Summary Report--which lists the major objectives of the entire study, to develop an all digital vehicle simulation for handling and braking, to develop a human driver simulation for evaluating handling capabilities of closed loop vehicle-driver systems, and to investigate methods for describing the directional stability and control of automobiles applicable to nonlinear transit response.

Mitchell, B   Abrams, R   Scott, RA
Michigan University, Ann Arbor, National Highway Traffic Safety Administration   Final Rpt.   HS-805 362, May 1979, 38p

Volumes 2-8 are HS-805 363--HS-805 371.
Contract

DOT-HS-7-01715

Acknowledgment: NTIS
Order From: NTIS

PB80-207061

318911

IMPROVEMENT OF MATHEMATICAL MODELS FOR SIMULATION OF VEHICLE HANDLING. VOLUME 8. SUMMARY REPORT

Major objectives of the study were as follows: To develop an all digital vehicle simulation for handling and braking; To develop a human driver simulation for evaluating handling capabilities of closed loop vehicle-driver systems; and to investigate methods for describing the directional stability and control of automobiles applicable to nonlinear transient response.

Garrott, WR   Scott, RA
Michigan University, Ann Arbor, National Highway Traffic Safety Administration   Final Rpt.   HS-805 371, Mar. 1980, 17p

Volumes 1-7 are HS-805 362--HS-805 370.
Contract

DOT-HS-7-01715
Acknowledgment: NTIS
Order From: NTIS

PB80-207129

318981

DRUG RESEARCH METHODOLOGY. VOLUME I. THE ALCOHOL-HIGHWAY SAFETY EXPERIENCE AND ITS APPLICABILITY TO OTHER DRUGS

The report presents the findings of a workshop concerning the alcohol and highway safety experience, which includes research efforts to define the drinking-driving problem and societal responses to reduce the increased highway safety risk attributable to alcohol. A cross-disciplinary panel of experts examined its history, methodologies employed in research, and approaches to the development and implementation of preventive measures (countermeasures). From these discussions a conceptual framework for use in comparing alcohol and other drugs was developed. Categories include (1) the process of risk identification; (2) measures of risk to indicate impaired driving ability; and (3) approaches to preventive measures that reduce the increased highway safety risk attributable to alcohol and other drugs. The report summarizes comparisons between alcohol and other drugs.

Donelson, AC Marks, ME Jones, RK Joscelyn, KB
Highway Safety Research Institute, National Highway Traffic Safety Administration Final Rpt. UM-HSRI-80-17, HS-805 374, Mar. 1980, 74p, 39 Ref.

Volume 2 is HS-805 299; Volume 3 is HS-805 375; Volume 4 is HS-805 485; and Volume 5 is HS-805 462. See also HS-803 879 and HS-805 461.
Contract

DOT-HS-7-01530

Acknowledgment: NTIS
Order From: NTIS

PB80-223522

319845

BICYCLING INJURIES

The increase in the use of bicycles has been paralleled by an increase in bicycle accidents. Safety education programs, especially for young people, might reduce the number of injuries. (A)

Davis, MW Litman, T Crenshaw, RW Mueller, JK *Physician and Sports medicine* Vol. 8 No. 5, HS-032 426, May 1980, pp 88-96, 4 Tab., 2 Phot., 14 Ref.

Acknowledgment: National Safety Council, Safety Research Info Serv (800428J)

Order From: McGraw-Hill, Incorporated, 1221 Avenue of the Americas, New York, New York, 10020

325077

MOTOR VEHICLE IN THE USSR: A STATUS REPORT

Soviet trucks are sturdily made and easy to operate and service. By comparison with U. S. trucks, Soviet trucks are underpowered, slow, and have low payload ratings. As for easy operation, all Soviet trucks with rated load capacities over one ton come with power-assisted brakes, and those rated at over four tons have power steering-- features which are sold as optional extras on many U. S. trucks.

Automotive Engineering Vol. 88 No. 5, HS-032 745, May 1980, pp 75-79

Acknowledgment: EI
Order From: ESL

326369

MANPOWER DEVELOPMENT: EDUCATION AND TRAINING (REVISED EDITION)

The bibliography contains abstracts of literature acquired since the establishment of the National Highway Traffic Safety Administration (NHTSA) relating to manpower development, education and training in the field of highway traffic safety. It included NHTSA-sponsored curriculum and course materials, manuals, training aids, education and training guides, manpower staffing guides, and self-study workbook-cassette tape training modules; education and training reports, manuals and curriculum materials prepared by other organizations concerned with highway traffic safety; and education, training and staffing-related articles from periodicals in related fields. It is intended for use by managers and administrators concerned with manpower planning, staffing and training, instructors, course planning and development personnel and others concerned with highway traffic safety.

Tarrants, WE Flynn, L
National Highway Traffic Safety Administration SB-41, HS-805 337, May 1980, 366p, Refs.

This is a revised and updated edition of SB-29, HS-803 366.

Acknowledgment: NTIS
Order From: NTIS

PB81-108151

329043

MARKET ANALYSIS AND CONSUMER IMPACTS SOURCE DOCUMENT-PART I THE MOTOR VEHICLE MARKET IN THE LATE 1970'S

The source document on motor vehicle market analysis and consumer impact consists of three parts. Part I is an integrated overview of the motor vehicle market in the late 1970's, with sections on the structure of the market, motor vehicle trends, consumer trends, and market outlook. Part II consists of studies and reviews on: motor vehicle sales trends; motor vehicle fleet life and fleet composition; car buying patterns of the business market; impact of down sizing on automotive preference of new car buyers; demand for light trucks, recreational vehicles, used cars, and station wagons; and consumer expenditures for private motor vehicle transportation. Part III consists of studies and reviews on: consumer awareness of fuel efficiency issues; consumer acceptance of fuel efficient vehicles; car size choices; passenger car choices; truck choices; and motor vehicle usage trends.

Schaeffer, KH Lesueur, O Hollingsworth, L Yarmus, J Rudman, L Westenberg, D
Transportation Systems Center, National Highway Traffic Safety Administration Final Rpt. DOT-TSC-NHTSA-80-2.I, HS-805 263, Dec. 1980, 99p, 48 Ref.

See also Part II, HS-805 264, TRIS 337224.
Contract

PPA-HS-163

Acknowledgment: NTIS
Order From: NTIS

PB81-156283

329640

DRIVER BEHAVIOUR RESEARCH-NEEDS AND PRIORITIES

Driver behaviour research is defined as research directed at describing, classifying, understanding and predicting the behaviour of the driver in the operation of the road transport system. Evaluating the effectiveness of driver control measures is thus excluded from this review. The "task--demand" and "cognitive--motivational" models of driver behaviour are examined to bring out the influence of personal factors in driver decision-making, risk-taking and hence actual on-road behaviour. A case is made for a greater research effort into the behavioural, as well as the situational, determinants of variability in on-road behaviour. Research into individual differences is then reviewed, covering personality, skills and driving style. A case is made for more research into transient states rather than "personality" traits; composite measures of perceptual functioning rather than basic visual and motor abilities; and the systematic investigation of normative patterns of on-road driving behaviour. Major research needs identified include a shift in emphasis from accident-related to normal behaviour; systematic, observational studies to describe and classify behavioural patterns, including the role of task-related and personal factors in behavioural variability; a re-examination of driving aids in terms of their in-service performance, as distinct from their ergonomic soundness; and an assessment of the implications of "common" conditions such as fatigue and impairment by alcohol on system design and management (a). (TRRL)

Johnston, IR Perry, DR
Australian Road Research Board, (0518-0728) Monograph Res Rpt ARR 108, HS-032 466, May 1980, 39p, 2 Fig., 125 Ref.

Acknowledgment: TRRL (IRRD 239902), Australian Road Research Board

Order From: Australian Road Research Board, P.O. Box 156, Bag 4, Nunawading, Victoria 3131, Australia

330774

EVALUATION OF "BETTER DRIVING" COURSES RUN BY POLICE FORCES FOR THE PUBLIC

Police forces throughout the country provide "better driving" courses for members of the public. These courses attempt to improve their knowledge with the object of making them better drivers. Normally such courses consist of several lectures and a demonstration drive. Those students who participated in the study were given theoretical and practical (road) tests before and after they attended a course of police lectures and courses run by 10 different police forces were included in the study. A marked improvement in post-course performance resulted, both in students' knowledge of driving and also in their practical driving performance. (Author/TRRL)

Fazakerley, JA Davies, RF Henderson, R Sheppard, D
Transport and Road Research Laboratory Monograph TRRL LR949, HS-032 499, 1980, 16p, 15 Tab., 9 Ref.

Acknowledgment: TRRL (IRRD 251851)
Order From: TRRL

330775

CROSS-OVER ACCIDENTS IN ALL-PURPOSE DUAL CARRIAGEWAYS

Accident data for some, mainly rural, dual carriageway roads have been examined in order to assess the possible effect on the frequency of casualties and of damage-only accidents of central safety fences installed as a general policy on such roads. It is estimated that the erection of a safety fence would result in a reduction in fatal casualties, little change in serious and slight casualties and an increase in non-injury accidents. (Author/TRRL)

Johnson, HD
Transport and Road Research Laboratory Monograph TRRL SR 617, HS-032 455, 1980, 9p, 5 Tab., 2 Ref.

Acknowledgment: TRRL (IRRD 251852)
Order From: TRRL

330780

THE EFFECT OF AN ADVISORY SPEED SIGNAL ON MOTORWAY TRAFFIC SPEED

The effect on vehicle speeds of a rural motorway matrix signal, displaying a 50 mile/h advisory speed limit, was measured on M4 in both wet and dry weather. When the speed limit was displayed the mean car speed at the test site reduced from 72.1 mile/h to 67.2 mile/h in dry weather, and from 70.6 mile/h to 67.9 mile/h in wet weather. When corrected to allow for speed changes at the control site, these reductions correspond to 4.8 per cent and 4.9 per cent respectively. Heavy vehicles were little affected by the signal-their normal speed was not much higher than the advisory limit. The average speed of vehicles was between 5 mile/h and 11 mile/h higher than those measured in a similar trial on M1. Furthermore, speed reductions in response to the signal were much smaller on M4. These differences were mainly due to a slight difference in gradient and the higher flow of M1. A modified signal, giving drivers more information than at present, is being tested in an attempt to improve drivers' response. (Author/TRRL)

Webb, PJ
Transport and Road Research Laboratory Monograph TRRL SR 615, HS-032 479, 1980, 8p, 2 Fig., 3 Tab., 1 Phot., 2 Ref.

Acknowledgment: TRRL (IRRD 251860)
Order From: TRRL

331215

EVALUATION OF DIFFERENT TYPES OF CHILD RESTRAINT SYSTEMS FOR CARS

All occupants in a car, children and adults, can and should be restrained. (VIth Int. Conf. of I.A.A.T.M., 1977) The undoubted benefits of seat restraints in the event of a road crash are proven (Trinca, 1979) and total restraint of all occupants removes the threat of strapped occupants being subjected to excessive loading from unrestrained occupants. In no country have desired levels of wearing been reached without enactment of legislation making such use mandatory (Berard Andersen, 1978). Where laws have excluded children the wearing rate for children has been much lower. In all countries with or without compulsory wearing laws the wearing rate for young children has been significantly less than that for adults. Too many young children have been denied the benefit of restraint systems. In Australia where parents accept mandatory restraint for children, child restraint legislation has lagged behind that for adults and today there is still no uniformity of laws for children under 8 years of age (Boughton, 1978). However, by law all cars must have approved anchorage points for child restraints. In the U.S.A. there is as yet no effective seat restraint law, only 7% of children are restrained (cf. adult rate 14%) when they travel and the highest death rate for child passengers is in the first year of life (Baker, 1979). Children run more risk of death or injury travelling unrestrained in a car than being hit by a car whilst crossing a road (Vulcan, 1978). Unrestrained children in the front seat are twice as likely to be killed or injured as those in the rear compartment. Many adults do not appreciate the fact that restraining arms holding a child on the lap are totally inadequate in protecting a child in a road crash (Journal of Traffic Medicine, 1979).

Arnberg, PW Arnberg, L Trinca, GW
National Swedish Road & Traffic Research Institute HS-032 500, 1980, pp 99-107

Proceedings of the 8th International Conference International Association for Accident and Traffic Medicine, held at the University of Aarhus, June 10-13, 1980.

Acknowledgment: National Safety Council, Safety Research Info Serv (810063 R)
Order From: National Swedish Road & Traffic Research Institute, Fack, S-581 01 Linkoeping, Sweden

331278

RECOMMENDED PROCEDURES FOR THE SAFETY PERFORMANCE EVALUATION OF HIGHWAY APPURTENANCES

Procedures are presented for conducting vehicle crash tests and in-service evaluation of roadside appurtenances. Appurtenances covered by these procedures are (1) longitudinal barriers such as bridge rails, guardrails, median barriers, transitions, and terminals; (2) crash cushions; and (3) breakaway or yielding supports for signs and luminaires. The purpose of the procedures is to promote the uniform testing and in-service evaluation of roadside appurtenances so that highway engineers may confidently compare safety performance of two or more designs that are tested and evaluated by different agencies. These procedures are guidelines that describe how an appurtenance should be tested and evaluated; the selection of specific new, existing, or modified appurtenances for testing and evaluation, the establishment of acceptable performance criteria are policy decisions that are beyond the purview of this document. These procedures are devised to subject highway appurtenances to severe vehicle impact conditions rather than to "typical" or the more predominant highway situations. For vehicle crash testing, specific impact conditions are presented for vehicle mass, speed, approach angle, and point on appurtenance to be hit. Vehicle types considered are mini-compact, subcompact, and standard size passenger sedans, intercity and utility type buses, and tractor-trailer cargo trucks. Impact speeds range from 20 to 60 mph (32 to 97 kph), and approach angles vary from 0 to 25 deg. Three appraisal factors are presented for evaluating the crash test performance: structural adequacy, occupant risk, and vehicle after-collision trajectory. Depending on the appurtenance's function, it should contain, redirect, or permit controlled penetration of the impacting vehicle in a predictable manner to satisfy structural adequacy requirements.

Michie, JD (Southwest Research Institute) *NCHRP Report* No. 230, HS-032 597, Mar. 1981, 42p, Figs., Tabs., Refs., Apps.

Order From: TRB Publications Off

331446

ROAD SAFETY IN THE SEVENTIES: LESSONS FOR THE EIGHTIES

This paper provides detailed evidence as to the problems of road safety and describes some of the past, current and proposed remedies in New South Wales and, to a degree, in Australia generally, many of which will be applicable to other heavily motorised countries. Of particular note are reviews of seat belt, child restraint and motorcyclist helmet usage, performance and developments; the future of occupant protection generally; the attitudes of motorcycle riders to official intervention for their safety; drink- driving (and "riding"); and roadside power poles (A). (TRRL)

Herbert, DC
New South Wales Dept of Motor Transport, Australia, (0313-2854) Monograph Res Rpt. 4/80, HS-032 604, Mar. 1980, 155p, 25 Fig., 38 Tab., 95 Ref.

Acknowledgment: TRRL (IRRD 250436), Australian Road Research Board
Order From: New South Wales Dept of Motor Transport, Australia, 56 Rothschild Avenue, Roseberry, New South Wales 2018, Australia

331743

FATAL FALLS AND JUMPS FROM MOTOR VEHICLES

In 1978, 345 persons were killed in the United States in jumps and falls from non-crashing motor vehicles: 64 percent jumped; and it was not known whether the other 21 percent jumped or fell. Two hundred and one people had been traveling on the exterior of vehicles, especially truck beds, and almost all of these people fell from their vehicles. The other 144 fatalities involved people in passenger compartments. Many of the falls from compartments occurred when occupants opened doors, or when vehicles changed direction. Seventy-seven percent of those who fell from passenger compartments were males, and 44 percent were less than five years old. Among those who jumped from vehicle compartments, 62 percent were women and all were older than 14 years. Fatal falls and jumps from vehicles could be reduced in a variety of ways. These include legislation to prohibit travel in vehicle exteriors, designing vehicles so that doors cannot be opened when in motion, improving door designs, installing signals that provide warning if doors are not closed completely, and using occupant restraints. (Author)

Williams, AF Goins, SE *American Journal of Public Health* Vol. 71 No. 3, HS-032 277, Mar. 1981, pp 275-279, 6 Tab., 12 Ref.

Acknowledgment: National Safety Council, Safety Research Info Serv (810134 J)
Order From: American Public Health Association, 1740 Broadway, New York, New York, 10019

334826

DAYTIME MOTORCYCLE CONSPICUITY

Investigations into accidents involving motorcycles and other vehicles revealed that motorcyclists were frequently not seen by other road users. Under contract to TRRL the Institute for Consumer Ergonomics conducted six separate studies to consider the problem of daytime conspicuity and possible means of enhancing the conspicuity of motorcyclists and their machines. Laboratory experiments using tachistoscopic methods (visual exposures to measure detection times) determined the "attention getting" properties of various fluorescent clothing options. These results were confirmed in field experiments in which different lighting options on the machine were also tested. The three options found to significantly increase the conspicuity of the motorcycle and rider during daylight were: the use of dipped headlights on large motorcycles. The wearing of a high visibility jacket or waistcoat. The daytime use of one running light. Two running lights performed better still. Many other findings about daytime conspicuity were obtained. (Author/TRRL)

Fulton, ET Kirkby, C Stroud, PG (Loughborough University of Technology, England)
Transport and Road Research Laboratory, (0305-1315) Monograph SR625, HS-032 456, 1980, 20p, 3 Fig., 5 Tab., 4 Ref.

Acknowledgment: TRRL (IRRD 252582)
Order From: TRRL

334829

SOME ASPECTS OF MOTORWAY TRAFFIC BEHAVIOUR IN FOG

This report describes an experiment to determine the effect of fog on the speed and spacing of traffic on the M4 motorway. A discussion of visual range in day and night-time fogs is included to show that these two conditions should be considered separately. In the range of day-light fogs tested (visibility down to 150 M) the relations between mean traffic speed and visibility are well defined and remain substantially unaffected until the driver's visibility distance, as given by a measure of the meteorological visual range, falls below about 200 M. In a similar range of night-time fogs mean traffic speeds are more variable, but the trend is similar to day-time if the driver's visibility distance is taken as the maximum distance at which a vehicle rear light of about 2 candela intensity can be seen through a dipped headlamp beam. In conditions where the visibility distance does not fall below about 150 M, average traffic speeds are generally sufficiently low to enable most drivers to stop within their visibility distance, but the reduction in speed with reducing visibility is accompanied by an increase in close following causing an overall increase in risk. Around one-third of all vehicles follow within a 2 second inter-vehicle time gap when driver visibility distances are reduced to 150 M in day or night-time fog conditions. (Author/TRRL)

White, ME Jeffery, DJ
Transport and Road Research Laboratory, (0305-1293) Monograph LR 958, HS-032 640, 1980, 23p, 11 Fig., 4 Tab., 17 Ref.

Acknowledgment: TRRL (IRRD 252586)
Order From: TRRL

334834

THE MALE DRINKING DRIVER: CHARACTERISTICS OF THE OFFENDER AND HIS OFFENCE

Data were collected on 1032 male drivers and riders charged with drink/driving offences in Birmingham during an 18 month period from 1 January 1976. In 350 cases, the data were augmented by additional information obtained by attending the relevant court cases. A sub-sample of 102 motorists whose cases were attended subsequently volunteered to be interviewed to obtain data on drinking and drink/driving habits. Control data were obtained by interviewing a representative sample of 300 male licence-holders in Birmingham who had no conviction for drink/driving offences. Two-thirds of the offenders who provided blood or urine samples had blood alcohol concentrations (BAC's) above 150 mg/100 ml. The median BAC was 178 mg/100 ml. Comparisons of the offender and control groups suggested that offenders were more likely to be under 50; single, divorced or separated, in semi-skilled or unskilled manual socio-economic groups; unemployed; and to have previous motoring convictions. The offender group also tended to have a substantially higher weekly alcohol intake. Motorists who consume in excess of 180 GM of alcohol (approximately 12 pints of beer) over a period of one week appear to be particularly at risk of detection and conviction. Further emphasis needs to be placed upon the modification of individuals' habits and attitudes towards drinking and driving. (Author/TRRL)

Clayton, AB McCarthy, PE Breen, JM (Birmingham University, England)
Transport and Road Research Laboratory, (0305-1315) Monograph SR 600, HS-032 548, 1980, 24p, 1 Fig., 12 Tab., 7 Ref.

Acknowledgment: TRRL (IRRD 252591)
Order From: TRRL

334866

THE OWNERSHIP AND USE OF CARS BY ELDERLY PEOPLE

This report describes and explains present patterns of car availability and use among the elderly, and the role of different forms of transport in their daily travel. The main sources of data are the national travel survey and a survey of old people in Guildford. Comparisons are made between elderly people and younger adults. Levels of car availability and use vary within the elderly population according to personal and household circumstances. Past patterns of growth in car ownership and licence-holding and those changes associated with ageing which lead people to give up their cars are also strong influences on car availability. Data on the process of giving up cars and current levels of car availability among the people who will be elderly by 2001 are used to suggest levels of car availability among the elderly in 2001. It appears that while there will be substantial increases in car availability among the elderly, the overriding influences of health and financial circumstances will limit car availability so that at least half of the elderly population will be living in households without a car and will therefore be largely dependent on walking and some form of public transport for meeting daily requirements.(a) (TRRL)

Hopkin, JM
Transport and Road Research Laboratory, (0305-1293) Monograph TRRL LR 969, HS-032 572, 1981, 53p, 9 Fig., 23 Tab., 32 Ref.

Acknowledgment: TRRL (IRRD 253526)
Order From: ESL

335154

CONSPICUITY ON THE HIGHWAY: A SYMPOSIUM SPONSORED BY THE COMMITTEE ON VISIBILITY. FOREWARD

The TRB Committee on Visibility has maintained a continuing effort to disseminate information on critical visibility topics to individuals responsible for providing motorists with a safer highway environment. Toward this end, since 1968 the Committee has sponsored six conferences and symposia, the most recent of which was the Symposium on Conspicuity on the Highway, held in St. Paul, Minnesota on June 24-26, 1980. This Circular presents most of the papers presented at the Symposium. The purpose of the Symposium was to present state-of-the-art information on techniques, devices and principles that can be used to increase the highway user's ability to detect relevant objects in his environment, day or night. Ten papers were presented dealing with the principles of conspicuity and the conspicuity of vehicles, people and highway elements. Workshops were held at the close of the Symposium to summarize the information presented and the conclusions reached. Publication of this Circular makes available to a large number of interested professionals a summary of most of the ideas and concepts discussed at this meeting. (Author)

Burg, A *Transportation Research Circular* No. 229, HS-032 443, May 1981, p 2

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335155
PRACTICAL ASPECTS OF CONSPICUITY PRINCIPLES

A brief overview is presented of the wide variety of highway characteristics, vehicles, people and other objects that must be made conspicuous. It is clear that conspicuity is important for safety and for smooth traffic operation. The complexity of requirements for conspicuity is indicated. Color and luminance contrast, relative luminance, relative contrast and relative size have been shown to be very important factors for conspicuity and recognition. A few examples indicated some of the research which has been carried out in related areas. Other examples are given to show practical application of these factors for safety and smooth operation of traffic.

Forbes, TW (Michigan State University, East Lansing) *Transportation Research Circular* No. 229, HS-032 444, May 1981, pp 3-9, 7 Fig., 4 Tab., 15 Ref.

Presented at the Symposium on Conspicuity on the Highway, St. Paul, Minnesota, 24-26 June 1980.

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335156
PROVIDING FOR VISIBILITY IN NIGHT DRIVING

Until some of these potential tools are developed we are faced with mostly subjective judgments of the adequacy of visual environments and severely limited budgets with which to attempt to meet all needs. This paper is a review of the driver's information needs and some of the considerations which may be helpful in meeting them within the confines of practical programs. The EIDAC model is used to remind designers and traffic engineers that users are diverse and most are different in their needs compared to the people who typically attempt to provide for these needs. Observers who are not familiar with an area are better able to judge the users' needs, and if possible, lay volunteers should be included on site visits in which delineation adequacy is under study. The unusual or rare need may still be a highly legitimate one in terms of accident prevention. In most cases, the information system designer must consider all five aspects of the EIDAC model: expectancy shaping, information provision, decision processes, action requirements, and confirmatory information after an action. Some examples of novel and possible visual information sources have also been discussed. (Author)

Olsen, RA (Pennsylvania State University, University Park) *Transportation Research Circular* No. 229, HS-032 445, May 1981, pp 10-14, 7 Ref.

Presented at the Symposium on Conspicuity on the Highway, St. Paul, Minnesota, 24-26 June 1980.

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335157
DAYLIGHT FLUORESCENT COLOR--THE COLOR THAT SHOUTS

The objective of this presentation is to give a layman's definition for the phenomenon and a brief history of successful uses of daylight fluorescent colors in safety products and applications. Fluoresence is defined as the phenomenon in which light energy of a relatively short wavelength is converted into visible light energy of a longer wavelength. In comparing fluorescent and conventional red-orange color examples side by side under simulated daylight, the two surfaces appear quite similar. Both are obviously reflecting red-orange light to our eyes and the primary difference is that the fluorescent example is brighter. However, when the samples are illuminated with yellow-green light, something very unusual occurs. The conventional color appears to darken, while the fluorescent surface continues to emit a distinctive red-orange effect. This is due to its ability to convert yellow-green to red-orange, rather than absorbing the transmitted light as does the regular red-orange. The effect is even more dramatic with short wavelength blue-violent light. Conventional red-orange goes almost completely black, while the fluorescent again continues to emit bright red-orange color. Thus, fluorescent colors are brighter than ordinary colors because they are capable of converting light energy that is normally absorbed and wasted to visible light, which in turn reinforces the color in intensity. Hence, there is greater visibility in daylight conditions. (Author)

Smith, HJ (Day-Glo Corporation) *Transportation Research Circular* No. 229, HS-032 446, May 1981, pp 15-16

Presented at the Symposium on Conspicuity on the Highway, St. Paul, Minnesota, 24-26 June 1980.

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335158
DETECTION AND RECOGNITION OF PEDESTRIANS AT NIGHT

The data presented clearly indicate that retroreflective treatments on pedestrians can increase the distance at which they are detected and recognized. Thus, it is a reasonable extension of these results to postulate a safety benefit from the widespread use of appropriately designed retroreflective garments at night. However, it must be remembered that all subjects in the reported experiments were alerted, had normal vision and were neither fatigued nor intoxicated when the data were collected. Therefore, care must be exercised in extending these findings, particularly the extent of improvement in detection and recognition, to the entire population of drivers. Until additional research can be conducted to refine even further the optimal design for a retroreflective countermeasure for pedestrians, the foregoing findings can be utilized to begin to enumerate several basic principles. First, to improve detection, one should use bright target materials. Consistently, these studies showed that each increment in target brightness tested produced a corresponding increase in detection distance. In these studies, brightness was a more important influence on detection than was the total target area, even though the targets ranged in size from a minimum of four square inches to a maximum of several square feet. Second, identification of the targets as pedestrians requires more than mere early detection. Anthropomorphism of the target shape greatly aids recognition. In these studies, shapes which are commonly associated with "people" led to effective identification even though the shapes only partly reproduced the human form. Retroreflective jackets seemed to produce a significant improvement in recognition. Retroreflective trousers were significantly better than jackets, and the combination of the two was better than either alone. Shapes which did not represent human figures, articles of clothing or other visual forms associated with the human figure--spots and stripes--did not enhance and may actually inhibit recognition of the pedestrian figures. Hence, for improved safety, it would appear best to outline the body as completely as possible with the brightest material available. Finally, the excellent prediction of suburban course results from dark course findings is of interest. It means that the relative effectiveness of new pedestrian conspicuity enhancers can be assessed under totally dark field test conditions, which are easier to establish and control for experimental purposes. Thus, the further refinement of the design of retroreflective treatments for pedestrians should not be significantly hampered by test and evaluation costs. (Author)

Blomberg, RD Leaf, WA Jacobs, HH (Dunlap and Associates, Incorporated) *Transportation Research Circular* No. 229, HS-032 447, May 1981, pp 17-21, 6 Fig., 8 Ref.

Presented at the Symposium on Conspicuity on the Highway, St. Paul, Minnesota, 24-26 June 1980.

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335159
EFFECTS OF MOTORCYCLE AND MOTORCYCLIST'S CONSPICUITY ON DRIVER BEHAVIOR

The purpose of this study was to determine whether the conspicuity of motorcycles/motorcyclists could be improved to reduce multivehicle motorcycle crashes. Various conspicuity-increasing treatments were fabricated and tested, using a realistic driving situation and measuring the response of naive drivers. It appears that there are a number of ways to improve daytime motorcycle/motorcyclist conspicuity that should have a meaningful effect on the behavior of car drivers. The simplest is to drive with the headlamp on at all times. The modulating headlamp may be somewhat more effective, but does require some investment on the part of the motorcyclist. High-visibility materials seem quite effective as well, but work better when worn by the rider than when fitted to the bike. The latter finding is somewhat surprising. In the opinion of the investigators, the fluorescent fairing treatment was a more effective attention getter than the fluorescent vest or helmet cover. Yet the field test data indicate the opposite. This suggests that laboratory studies of motorcycle consipicuity can produce misleading results. However, it is not clear why the results came about. One possible explanation is that effectiveness is improved by height. Another is that by emphasizing the rider, speed-spacing judgments are facilitated. This might happen because apparent size is an important distance cue. However, it is based on knowledge of actual size. Most drivers know less about the size of motorcycles, especially motorcycle fairings, than they do about people. For nighttime riding conditions there may be value in wearing retroreflective garments and using running lights. Retroreflective treatments applied to the bike seem less effective, but may be of help. There are combination fluorescent/retroreflective materials available which can provide day and night conspicuity in one package. It is also possible to treat ordinary fabric with beads and make it retroreflective without changing its appearance under normal viewing conditions. This may have potential for other vehicles with conspicuity problems as well. (Author)

Olson, PL (Highway Safety Research Institute) Halstead-Nussloch, R (Stevens Institute of Technology) Sivak, M (Highway Safety Research Institute) *Transportation Research Circular* No. 229, HS-032 448, May 1981, pp 22-25, 8 Fig., 2 Ref.

Presented at the Symposium on Conspicuity on the Highway, St. Paul Minnesota, 24-26 June 1980.

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335160

DETECTABILITY OF HIGHWAY SIGNS

Detectability is one of the primary criteria for an effective traffic sign. Several factors including sign characteristics, condition of the sign, driver information load, sign placement, environment conditions (darkness and poor weather), and individual differences among drivers, influence whether a traffic sign will be detected. Each of these factors is examined in a review of the relevant literature. (Author)

Dewar, RE (Calgary University, Canada) *Transportation Research Circular* No. 229, HS-032 449, May 1981, pp 26-30, 22 Ref.

Presented at the Symposium on Conspicuity on the Highway, St. Paul, Minnesota, 24-26 June 1980.

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335161

SIZE VERSUS INTENSITY AS AIDS TO SIGNAL CONSPICUITY

The results obtained in this study indicate that for daytime and nighttime there exist (different) supra-detection threshold values for the contrast between the light source and the "near" background such that any small increase in the luminance of the light source (such as doubling or tripling) will result in neglible improvement in the target value of the light source. Once the contrast exceeds this supra-detection threshold, increasing signal size is far more effective than increasing signal brightness as a means for improving target value. The nighttime data show that this contrast value was exceeded, while daytime results indicate that, without backplates, it was not. Daytime fog test results suggest that size, while more critical to target value than luminance, is, however, not completely dominant, as evidenced by the significant increase in target value resulting from doubling the luminance of the smaller, 8-inch (20.3 cm) head. (Author)

Ruden, RJ (JGM Associates, Incorporated) Burg, A *Transportation Research Circular* No. 229, HS-032 450, May 1981, pp 31-34, 1 Tab., 9 Ref.

Presented at the Symposium on Conspicuity on the Highway, St. Paul, Minnesota, 24-26 June 1980.

ORDER FROM: TRB Publications Off

335162

DETECTION OF WORK ZONE TRAFFIC CONTROL DEVICES

This paper reviews recent research on the visibility of and driver reaction to various work zone traffic control devices. The greatest problem with advance signing is credibility, since the work zone situation will frequently change after the sign is erected. The recognition distance of arrow boards is between 725-1175 feet, depending on speed. They are most useful for lane closures by promoting earlier merging. Only in specific situations are they useful for lane diversion. A study of concrete barrier visibility focused heavily on the durability of six reflective products over two years. From a visibility perspective, reflectors were superior to reflectorized tape. A study of cones, tubes, barricades, panels, drains, and steady burn lights indicates relatively successful detection and path guidance performance by most devices. One of the major deterrents to effectiveness is not the device, but the position, dirty, or overturned devices destroy the visual line or path created by channelizing devices. Therefore, use of appropriate devices is important but diligent set-up and care of the work zone is equally important.

Pain, RF (Biotechnology, Incorporated) *Transportation Research Circular* No. 229, HS-032 451, May 1981, pp 35-37, 1 Tab., 9 Ref.

Presented at the Symposium on Conspicuity on the Highway, St. Paul, Minnesota, 24-26 June 1980.

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335163

NIGHTTIME DETECTION OF BICYCLES

A case is made in this paper for the importance of peripheral visual detection in the nighttime bicycle detection problem. Based upon the findings of this field study, a reflector arrangement consisting of two horizontally separated high performance rear reflectors in combination with an improved taillight and improved pedal reflectors would seem highly promising and beneficial with regard to the rear conspicuity (detection) problem of bicycles at night. More research is needed to get a better understanding of the human visual detection mechanisms involved in foveal vs. peripheral detection at night. Also more research is needed to examine the detection distance statistics and threshold multiples for more than two reflectors, for various reflector arrangements and separation distances, for various reflector or visual stimulus intensity levels and to determine appropriate correction factors to be used when performing engineering illumination or visibility calculations involving peripheral visual detection. (Author)

Zwahlen, HT (Ohio University, Athens) *Transportation Research Circular* No. 229, HS-032 452, May 1981, pp 38-49, 8 Fig., 4 Tab., 11 Ref.

Presented at the Symposium on Conspicuity on the Highway, St. Paul, Minnesota, 24-26 June 1980.

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335421

SAFETY EFFECTIVENESS EVALUATION--FEDERAL AND STATE ENFORCEMENT EFFORTS IN HAZARDOUS MATERIALS TRANSPORTATION BY TRUCK

The National Transportation Safety Board, at the request of the Senate Appropriations Committee, has just completed a safety effectiveness evaluation of Federal and State enforcement efforts in the area of bulk hazardous materials transportation by commercial motor vehicle. As a result of this evaluation, the Board found that there are several improvements that should be made to the enforcement activities of the Bureau of Motor Carrier Safety (BMCS) in the Federal Highway Administration (FHWA). In its evaluation, the Board staff interviewed BMCS officials in the headquarters office and in eight of the nine FHWA Regions. In addition, the Board staff interviewed State enforcement officials in 24 States, including 3 of the 4 States participating in the BMCS "Commercial Motor Carrier Safety Inspection and Weighing Demonstration Program." Because the BMCS enforcement of the motor vehicle-related Federal Hazardous Materials Regulations is not separate from its enforcement of the Federal Motor Carrier Safety Regulations, the Board found that, in general, the same deficiencies undermine the effectiveness of both efforts. Thus, the major findings of the Board concerning BMCS enforcement apply equally to enforcement of the motor vehicle-related Federal Hazardous Materials Regulations and the Federal Motor Carrier Safety Regulations.

National Transportation Safety Board, (3184) NTSB-SEE-81-2, HS-032 610, Feb. 1981, 110p, Figs., Tabs., Apps.

ORDER FROM: NTIS

PB81-180101

335587

STATE OF THE ART: RESIDENTIAL TRAFFIC MANAGEMENT

The research program "Improving The Residential Street Environment" deals with control and restraint or management of traffic on local residential streets. This State of The Art report covers current practices in this field through 1978. The report assesses the performance of various control devices to affect traffic on existing residential streets (as opposed to initial design features of new Subdivisions). Included are diagonal diverters, half-diverters, cul-de-sacs, median barriers, speed bumps and undulations, stop signs, rumble strips and many other measures. The report also details techniques for developing neighborhood traffic control plans including community involvement and technical evaluation elements. (FHWA)

Smith, DT, Jr   Appleyard, D
De Leuw, Cather and Company, DKS Associates, Federal Highway Administration   FHWA-RD-80- 92, HS-032 648, Dec 1980, 181p, 102 Fig., 14 Tab., 116 Ref., 5 App.
Contract

DOT-FH-11-9309

Order From NTIS

335717
FEDERAL, STATE AND LOCAL RESPONSES TO 1979 FUEL SHORTAGES

There are many lessons that can be learned from examining federal, state and local responses to the 1979 fuel shortages which can be applied to present and future energy contingency planning efforts to enhance their effectiveness. As part of a study performed for the Office of the Secretary, U.S. Department of Transportation, case studies were made of emergency transportation energy conservation actions implemented, or attempted, in Los Angeles, Dallas-Fort Worth, Minneapolis-St. Paul, Seattle, Rhode Island, and New York State. Information on responses to the fuel shortages for each case study area was obtained through on-site meetings with representatives of organizations having a strong interest in emergency transportation actions such as transit operators, metropolitan planning organizations, service station dealers, state highway and energy departments, ridesharing agencies, and others. Types of emergency transportation actions most commonly implemented or attempted by the case study areas were (1) expanded public information and marketing distribution systems, (2) emergency expansion of ridesharing (carpool and vanpool services), (3) rehabilitation and placing in service of standby reserve or "mothball" fleet buses, (4) implementation of odd-even and/or minimum (maximum) fuel purchase restrictions and (5) monitoring of transit ridership and shifting buses to the most heavily used routes. This report summarizes, and partially assesses, the major transportation energy contingency actions implemented, key implementation problems encountered, and actions planned but not implemented. Preliminary conclusions, recommendations, and implications for developing future transportation energy contingency plans are also presented. More detailed information on the individual case studies may be found in a separate volume. (Author)

Schueftan, O   Ellis, RH
Peat, Marwick, Mitchell and Company, Office of the Secretary of Transportation, (289-53265-30-40)   Summ Rpt.   DOT-P-30-81-05, HS-032 508, Feb. 1981, v.p.
Contract

DOT-OST-78-017.9

Order From NTIS

335718
MARIJUANA EFFECTS ON DRIVING, A SURVEY OF THE PERCEPTIONS, ATTITUDES AND PRACTICES OF HIGH SCHOOL STUDENTS

A survey was conducted to assess the perceptions, attitudes and practices of high school students concerning marijuana use and driving. A 72-variable questionnaire was administered in 100 high schools located in sixty communities in 16 states and one Canadian province. A total of 5457 valid questionnaires were obtained from approximately equal numbers of males and females. The non-random sample can be described as predominantly white and middle class with a small representation of other ethnic and socio-economic groups. Approximately three-quarters of the respondents live in the Northeastern United States. The states of New York and Pennsylvania account for 45% of the sample. This geographic distribution is important since the Northeastern region is reported to have the highest marijuana use rates in the United States (Johnston et al., 1980). These sample characteristics should be kept in mind in interpreting the data. The data show that marijuana users tend to view the effects of the drug more favorably than non-users. Similarly current users make more positive statements about marijuana effects than past users. Nonetheless, more than half of the total "ever-used" group judge driving skills to be harmed by marijuana. On the whole, respondents appear to rather accurately evaluate the general effects of marijuana, as well as the effects on driving. In spite of this positive finding there clearly are potential traffic safety problems associated with marijuana use by high school age drivers. First, many students believe that driving while really high is ill-advised but that driving after a few puffs of marijuana is safe. The difficulty with this kind of qualification in terms of the level of intoxication or the amount of marijuana is that the individual's assessment of his/her own state may be quite inaccurate. Further, it has not been established that a driver is unimpaired after a few puffs of marijuana. A second source of traffic safety problems is apparent in the expression of an attitude that "driving while high is o.k. for me." This assertion frequently is made by the same individual who recognizes that it is unsafe for others to drive after smoking and who will not ride with another driver who is high. The rationale for self-exemption from safety considerations is not given in the questionnaire data. Finally, there are marijuana users who agree that it is unsafe to drive while high on marijuana but indicate that they do it anyway. This relatively small number of drivers know that they are behaving in a potentially dangerous manner when they elect to drive after smoking. Drug education efforts should continue to provide scientifically valid information about marijuana to high school students, many of who are or will become marijuana users. At the present time, a majority of adolescents can be expected to have at least some experience with the drug, and they need to be as fully informed about its effects as possible. In addition, it appears that considerable emphasis should be given to responsible social behaviors and driving practices in relation to drug use. (Author)

Burns, M
Southern California Research Institute, AAA Foundation for Traffic Safety   HS-032 552, 1981, 78p, 20 Fig., Tabs., 15 Ref., 3 App.

Order From Southern California Research Institute, 6305 Arizona Place, Los Angeles, California, 90045

335739
AN EVALUATION OF THE SHORT-TERM EFFECTS OF THE VIRGINIA DRIVER IMPROVEMENT PROGRAM

This study attempted to determine the impact of the driver improvement program on Virginia's traffic and safety environment in terms of accidents and traffic convictions averted as a result of appropriate treatment, and to establish an ongoing system of data collection to be used by the Division of Motor vehicles to continually evaluate the effectiveness of the driver improvement program and to establish statewide norms for administrative evaluations. The driver improvement program was designed to diagnose and treat chronically unsafe drivers. Warning letters, one-time group meetings, traffic schools, suspension and other incentives are all discussed. The study found that the advisory letter as the initial contact with the negligent operator was found to be ineffective in reducing accident convictions. The group interview by itself, was found to be effective in improving some types of driving behavior. The personal interview in combination with other treatments was found to be effective in reducing major (6-point) convictions but ineffective in reducing minor convictions. No treatment was found to be effective in reducing accidents.

Lynn, C
Virginia Highway & Transportation Research Council   Intrm Rpt. VHTRC 81-R46, HS-032 276, Apr. 1981, v.p., 2 Fig., Tabs., 41 Ref., Apps.

335740
PEDESTRIAN SAFETY IN VIRGINIA: ACCIDENT CHARACTERISTICS AND SUGGESTED REVISIONS TO VIRGINIA'S PEDESTRIAN LAWS

The nature, characteristics, and severity of accidents involving pedestrians in Virginia was evaluated, and whether or not these data would suggest the need for changes in Virginia traffic laws affecting pedestrians was determined. An analysis of data on pedestrian accidents in Virginia revealed a number of situations that pose a significant risk of accident to pedestrians. A review of Virginia's pedestrian laws dealing with dangerous traffic situations showed that a number of revisions are called for to reduce pedestrian traffic risks. Comparisons between the Virginia Code, the Uniform Vehicle Code, and pedestrian statutes from other states revealed a number of areas with which the Virginia Code does not deal or with which it deals in an unclear or inadequate manner. Recommendations for changes in the Virginia Code were formulated by revising existing Virginia regulations to more closely conform to the Uniform Vehicle Code and the statutes of other states. The need for proposed revisions to the Virginia Code was considered in terms of the identified traffic risks pedestrians face in Virginia.

Eilenberger, DR
Virginia Highway & Transportation Research Council, Virginia Department of Highways and Transportation, Virginia University VHTRC 81-R44, HS-032 581, Apr. 1981, v.p., Tabs., 32 Ref., Apps.

ORDER FROM: Virginia Highway & Transportation Research Council, P.O. Box 3817, University Station, Charlottesville, Virginia, 22903

335914

EVALUATION OF THE EFFECTS OF A SELECTIVE TRAFFIC ENFORCEMENT PROGRAM ON SEAT BELT USAGE

A study was conducted to assess the impact of a Selective Traffic Enforcement Program (S.T.E.P.) on seat belt usage in the Ottawa area. The program consisted of greater police surveillance, increased charging of violators and mass media publicity of the program. It was predicted that during the program in Ottawa there would be increases in actual number of charges issued, public perception of number of charges issued, subjective probability of being charged, self-reported seat belt usage and observed seat belt usage. It was further predicted that after STEP, these positive changes would still be apparent. In contrast, no changes in these variables were expected in Kingston, the control city, where there was no change in the enforcement of the seat belt legislation. Seat belt usage surveys and telephone surveys were conducted in Ottawa and Kingston, before, during, one month and six months after the program. For the survey of seat belt usage, sites, time of week and times of day, and observers were constant for all four survey waves. A stratified sample of drivers was interviewed concerning attitudes toward seat belts, use of seat belts, subjective probability of being charged for violating the seat belt legislation, perceived level of enforcement, and attitudes toward the seat belt legislation and its enforcement. The effects of increased enforcement on traffic violations and on attitude changes were studied. Self-reported usage also increased in Ottawa but not in Kingston. One month and six months after the program, observed and self-reported seat belt usage was still higher than the baseline level in Ottawa but subjective probability had returned to baseline level. The data supported predictions for Ottawa suggesting that the effects of increased enforcement on traffic violations for Ottawa suggesting that the effects of increased enforcement on traffic violations may be mediated by subjective probability of being charged. The unexpected increase in subjective probability of being charged in Kingston in the absence of any change in seat belt enforcement may have been the result of an increase in the enforcement of other traffic offences (e.g. speeding) which suggests that selective traffic enforcement may have carry-over effects to other offences. The failure to observe an increase in compliance with an increase in subjective probability suggests that a threshold of subjective probability may have to be attained before compliance occurs. Unexpected attitude changes are discussed in terms of reactance. (A)

Jonah, BA Dawson, NE Smith, GA Kirby, D
Transport Canada Research and Development Centre TP 3126 E, HS-032 275, May 1981, 39p, Tabs., 18 Ref., 4 App.
This paper was presented at the Annual Meeting of the Canadian Psychological Association, June 1980 in Calgary, Alberta.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: Transport Canada Research and Development Centre, Road and Motor Vehicle Traffic Safety Branch, Ottawa, Ontario K1A 0N5, Canada

335992

TEMPORARY BARRIERS USED IN CONSTRUCTION ZONES

In and around highway construction zones, delineation devices as well as barriers are used to control and restrict the flow of traffic. The need for positive, containing barriers was recognized by the Federal Highway Administration (FHWA). The FHWA further recognized that many temporary barrier devices were being used without documented performance. Accordingly, four temporary barriers were selected for crash test evaluation: (1) 25x25 cm(10"x10") timber barrier; (2) W-beam/barrel barrier; (3) Type X curb; (4) Stacked timber barrier. These barriers were subjected to controlled impacts with full size 2040-kg (4500-lb) cars impacting at angles from 7 to 15 degrees at speeds from 56 km/h (35 mph) to 90 km/h (56 mph). Results indicate the first and third barrier designs had minimal redirection/containment capacity, and performance was judged to be poor. The W-beam/barrel concept performed well during a 72 km/h (45 mph), 15-deg angle impact, but performance was unsatisfactory for 55 mph (88 km/h), 15-deg angle. The stacked timber barrier provided smooth redirection for both 35 mph (56 km/h) and 50 mph (80 km/h) impacts. (FHWA)

Bronstad, ME Kimball, CE, Jr
Southwest Research Institute, Federal Highway Administration, (03-3716-3) Final Rpt. FHWA-RD-80- 95, HS-032 652, Dec. 1980, 70p, 41 Fig., 6 Tab., 4 Ref., 2 App.
Contract

DOT-FH-11-8130

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337224

MARKET ANALYSIS AND CONSUMER IMPACTS SOURCE DOCUMENT. PART II. REVIEW OF MOTOR VEHICLE MARKET AND CONSUMER EXPENDITURES ON MOTOR VEHICLE TRANSPORTATION

This source document on motor vehicle market analysis and consumer impacts consists of three parts. Part II consists of studies and review on: motor vehicle sales trends; motor vehicle fleet life and fleet composition; car buying patterns of the business market; impact of downsizing on automotive preference of new car buyers; demand for light trucks, recreational vehicles, used cars, and station wagons; and consumer expenditures for private motor vehicle transportation.

Schaeffer, KH Lesueur, O Hollingsworth, L Yarmus, J Rudman, L Westenberg, D
Transportation Systems Center, National Highway Traffic Safety Administration Final Rpt. DOTTSC-NHTSA-80-2-II, HS-805 264, Dec. 1980, 288p, Refs.
See also Part I, HS-805 263, TRIS 329043.
Contract

PPA-HS-163

ACKNOWLEDGMENT: NTIS
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PB81-181265

337892

RETARDERS FOR HEAVY VEHICLES: EVALUATION OF PERFORMANCE CHARACTERISTICS AND IN-SERVICE COSTS. VOLUME I: TECHNICAL REPORT

The potential benefits to be derived from retarder use in heavy truck applications are evaluated in terms of (1) productivity gains due to decreased trip time, (2) cost savings due to decreased brake wear and maintenance, and (3) safety enhancement due to reduced probability of a runaway accident. The physical factors influencing downhill speed control are described and analyzed. The characteristics of currently available retarders are discussed. An assessment of the retarder market and its future potential is presented. An examination of available accident information is employed in developing safety performance analyses of heavy vehicles on downgrade sections of highways. The results of these various studies are applied in summarizing the items that prospective buyers of retarders need to know in order to estimate the cost benefits to be obtained from various levels of retarder power.

Fancher, PS O'Day, J Bunch, H Sayers, M Winkler, CB
Michigan University, Ann Arbor, National Highway Traffic Safety Administration Final Rpt. UM-HSRI-81-8-1, HS-805 807, Feb. 1981, 136p, Figs., Tabs., 10 Ref.
See also Volume 2, PB81-189995.
Contract

DOT-HS-9-02239

ACKNOWLEDGMENT: NTIS
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PB81-189987

337893

RETARDERS FOR HEAVY VEHICLES: EVALUATION OF PERFORMANCE CHARACTERISTICS AND IN-SERVICE COSTS. VOLUME II: APPENDICES

The potential benefits to be derived from retarder use in heavy truck applications are evaluated in terms of (1) productivity gains due to decreased trip time, (2) cost savings due to decreased brake wear and maintenance, and

(3) safety enhancement due to reduced probability of a runaway accident.

Fancher, PS O'Day, J Bunch, H Sayers, M Winkler, CB
Michigan University, Ann Arbor, National Highway Traffic Safety Administration Final Rpt. UM-HSRI-81-81-2, HS-805 808, Feb. 1981, 137p
See also Volume 1, PB81-189987.
Contract

DOT-HS-9-02239

Acknowledgment: NTIS
Order From: NTIS

PB81-189995

341009

"CAPTIVE COLUMN" CRASH TESTS. CRASH TESTING OF A LIGHT STANDARD LUMINAIRE POLE

Under contract No. DOT-FH-11-9606 the Nevada Department of Transportation (NDOT) conducted crash testing to study the capability of "Captive Column" light standard appurtenances under controlled conditions. The studies were precursors of actual on site studies and dealt with applicability under nearly ideal conditions and controlled crash guidance. Further testing will be completed under field study conditions (actual). The "Captive Column" was utilized to verify crashability. The tests were to simulate an actual automobile impact at a level angle. Two tests were run at a speed of 20 mph (8.9 m/x) and two at 40 mph (17.9 m/s) using slip bases and fixed bases. The lower section of the column broke away clean at the base and traveled with the vehicle, riding up and over the hood and top of the vehicle leaving marks at striking points. The "Captive Column", under conditions as ideal as possible, reacted exceptionally well, giving a favorable indication to test further. Tests will continue in actual service areas to further determine proper function. (FHWA)

Ross, BW Barry, DO Mierau, D
Nevada Department of Transportation, Federal Highway Administration Final Rpt. FHWA-RD-81-501, HS-032 431, Mar. 1981, 42p, 34 Fig., 4 App.
Contract

DOT-FH-11-9606

Order From: NTIS

341108

DIVIDED ATTENTION IN A REACTION TIME INDEX OF TRAFFIC SIGN PERCEPTION

Laboratory studies of traffic sign perception have often neglected to duplicate the divided attention demands of the driving task, even though it has been suggested that the inclusion of a loading task would increase the validity of such research. The present experiment examined the need for this division of attention by requiring subjects to identify traffic sign messages while performing a second, loading task involving the cognitive components of detection, identification or memory. A control group received no loading task. The reaction times to 16 signs were correlated with the legibility distances of the same signs measured in a previous roadway experiment. Contrary to the conclusion of Dewar et al (1976) that a loading task may increase the validity of the reaction time index, the present study found no advantage to using a loading task in association with the reaction time measure of traffic sign perception. (Author/TRRL)

Testin, FJ Dewar, RE (Calgary University, Canada) *Ergonomics* Vol. 24 No. 2, HS-032 464, Feb. 1981, pp 111-124, 2 Fig., 7 Tab., 8 Ref.
Direct reprint requests to Frank J. Testin, Canadian Automobile Association, 150 Gloucester Street, Ottawa, Ontario K2P 0A6, Canada.

Acknowledgment: TRRL (IRRD 254163)
Order From: Canadian Automobile Association, 150 Gloucester Street, Ottawa, Ontario K2P 0A6, Canada

341109

DRIVERS STEERING REACTION TO A LIGHT STIMULUS ON A DARK ROAD

When a car was approaching on a dark road, a small lamp was lit on the road shoulder. The onset of the light was timed by means of infrared beams directed over the road at a constant distance from each other so that for each passing car, a randomly selected beam was used to switch the lamp on. The lateral displacement due to the onset of the light was measured for 815 cars and lorries and these data were plotted as a function of the time available for this avoidance response. The average avoidance response, towards the centre-line, started at a latency of less than 2 s, reached its halfway strength at 2.5 s and its maximum at little more than 3 s. It was concluded that the typical driver/vehicle steering response latency, in a fully unexpected situation, is of the order of 2.5 s and the upper, safe limit at little more than 3 s. (Author/TRRL)

Summala, H (Helsinki University of Technology, Finland) *Ergonomics* Vol. 24 No. 2, HS-032 475, Feb. 1981, pp 125-131, 3 Fig., 13 Ref.

Acknowledgment: TRRL (IRRD 254164)
Order From: Taylor and Francis Limited, 4 John Street, London WC1N 2ET, England

341402

FOG DETECTION AND SOME EFFECTS OF FOG ON MOTORWAY TRAFFIC

This paper describes the results of an experiment to investigate the performance of fog detectors at the roadside and to show the effects of fog on motorway traffic. Fog detectors based either on optical scatter or optical transmission techniques can withstand prolonged exposure to the environment of a motorway verge, and the advantages and disadvantages of the two techniques are discussed. During daylight fogs affording visibility distances down to about 150 M, the relationship between mean traffic speed and the visibility distance, as measured by a fog detector, is shown to be well defined. Mean traffic speeds remain substantially unaffected until the visibility distance drops below about 200 M. During a similar range of night-time fogs, traffic speeds are more variable, but a trend similar to that for daylight fogs is obtained when visibility distances are taken as the distance at which a 2.5 candela rear light can just be seen through dipped headlamp beams. The tendency of traffic to platoon is shown to increase markedly with reducing visibility, but the mean speed of traffic is such that stopping distances are generally within visibility distances. (Author/TRRL)

Jeffery, DJ White, ME (Transport and Road Research Laboratory) *Traffic Engineering and Control* Vol. 22 No. 4, HS-032 509, Apr. 1981, pp 199-203, 5 Fig., 3 Tab., 12 Ref.

Acknowledgment: TRRL (IRRD 254234)
Order From: Printerhall Limited, 29 Newman Street, London, England

341403

DRIVER SPEED BEHAVIOUR AND RURAL ROAD ALIGNMENT DESIGN

The results of comprehensive speed measurements on curves and tangents of Australian two-lane rural highways have been used to develop a set of curve speed prediction relations. Curve speed is dependent on the desired speed of travel pertaining to the road section and the curve radius. The desired speed of travel is largely affected by the overall alignment standard of the road section. A comparison of the observed speeds and conventional design standards indicate that, for design speeds less than 90 km/h, most Australian drivers traverse curves at speeds in excess of the design speed. It is recommended that the design criteria for low-standard alignments should be amended to bring them into accord with actual driver behaviour, and design procedures should be directed at ensuring that variations in alignment standard are consistent with driver expectancies. (Author/TRRL)

McLean, J (Australian Road Research Board) *Traffic Engineering and Control* Vol. 22 No. 4, HS-032 471, Apr. 1981, pp 208-211, 4 Fig., 3 Tab., 14 Ref.

Acknowledgment: TRRL (IRRD 254236)
Order From: Printerhall Limited, 29 Newman Street, London, England

341439

THE ABBREVIATED INJURY SCALE: EVOLUTION, USAGE AND FUTURE ADAPTABILITY

Injury scaling as a means for classifying the extent of trauma has a long history. This paper describes the origin, development and usage of the abbreviated injury scale. Major revisions to AIS-80 are discussed in detail. Both the value of the AIS as a research tool and its limitations are presented. The critical need for training AIS users in proper application is addressed. The future role of the committee on injury scaling is explained, and three potential uses of the AIS are suggested as priority items. The paper, accompanied by a comprehensive bibliography, serves as a basic state of the art reference for physicians and other researchers in the traffic medicine and highway safety field. (Author/TRRL)

Petrucelli, E States, JD Hames, LN *Accident Analysis and Prevention* Vol. 13 No. 1, HS-032 300, Mar. 1981, pp 29-35, 2 Tab., 28 Ref.

Acknowledgment: TRRL (IRRD 254314)
Order From: Pergamon Press Limited, Headington Hill Hall, Oxford OX3 0BW, England

341441

PEDESTRIAN SAFETY IN THE UNITED STATES: SOME RECENT TRENDS

Although the state laws requiring motor vehicles to give way to pedestrians on crosswalks and at intersections are quite uniform from state to state, the degree of enforcement of these laws varies enormously. Driver behavior seems to reflect the level of enforcement rather than the text of the law. There is a tendency at all levels of government toward lax enforcement. (Author/TRRL)

Haight, FA Olsen, RA *Accident Analysis and Prevention* Vol. 13 No. 1, HS-032 580, Mar. 1981, pp 43-55, 7 Fig., 3 Tab., 10 Ref.

Acknowledgment: TRRL (IRRD 254316)
Order From: Pergamon Press Limited, Headington Hill Hall, Oxford OX3 0BW, England

341463

STATE OF THE ART AND FUTURE TREND OF HYDROGEN-FUELED ENGINES

The article compares hydrogen with liquefied natural gas (lng), or methane, and also alcohols as alternative engine fuels. Although it is shown that hydrogen is a promising fuel for the future, a difficult problem is that of storage with metal hydride and liquid hydrogen tanks considered to be the most feasible. The advantages of these methods are considered in detail. The author discusses the basic properties of hydrogen as an automobile fuel and also examples of hydrogen-fueled cars. (TRRL)

Furuhama, S (Musashi Inst Tech Tokyo) *JSAE Review* No. 4, HS-032 647, Mar. 1981, pp 53-68, 26 Fig., 1 Tab., 1 Phot., 25 Ref.

Acknowledgment: TRRL (IRRD 254573)
Order From: Society of Automotive Engineers of Japan, Inc, 10-2 Goban-cho, Chiyoda-ku, Tokyo 102, Japan

341465

EVALUATION OF MOTOR VEHICLE HANDLING

Motor vehicle handling is evaluated in various stages from vehicle development to selection of vehicles by end users, and this evaluation work is performed for different purposes. This report is designed to identify common ideas, rating efforts, and problem areas in different stages of vehicle handling evaluation. Reference is also made to the course and trend of studies for the evaluation of vehicle handling. (Author/TRRL)

Sano, S (Honda R & D Company Limited) *JSAE Review* No. 4, HS-032 501, Mar. 1981, pp 81-91, 15 Fig., 6 Tab., 19 Ref.

Acknowledgment: TRRL (IRRD 254575)
Order From: Society of Automotive Engineers of Japan, Inc, 10-2 Goban-cho, Chiyoda-ku, Tokyo 102, Japan

341523

TRANSPORTATION SAFETY INFORMATION REPORT, 1980 ANNUAL SUMMARY

Total transportation fatalities for 1980 decreased by 0.7 percent. The 54,507 fatalities for all modes was down slightly from the 1979 total of 54,887. Motor Vehicle Traffic fatalities totalled 51,077 in 1980 ... down just 0.03 percent from 1979. The fatality rate rose, however. U.S. Air Carriers achieved record low fatalities, fatal accidents, and total accidents in 1980. General Aviation total accident rates also reached record lows in 1980. Fatalities also dropped, while fatal accident rates increased slightly. Recreational Boating and Pipeline fatalities showed a drop during 1980, compared with 1979. (Author)

Compagna, M
Transportation Systems Center, Department of Transportation, (DTS-423) Final Rpt. DOT-TSC-RSPA-81-7, HS-032 622, June 1981, 81p, Figs., Tabs.

Order From: GPO

341634

INJURY PATTERNS OF MOTORCYCLISTS INVOLVED IN ACCIDENTS

Two injury studies are reported: a two-year hospital sample of 766 motorcycle casualties treated at one major accident hospital and a separate one-year sample of 41 fatally injured motorcyclists. National accident data indicate that motorcycle riders have a higher overall death and injury rate compared to car drivers in relation to their respective average distances travelled. In addition, motorcycle fatalities account for 55 per cent of road accident deaths in the 17-19 year age group. The studies showed that the body regions most frequently sustaining severe injuries are the head, arms and lower legs. Injuries to these body regions are mainly responsible for both prolonged in-patient treatment and also permanent disability. Serious injuries to the head frequently resulted in death. There was also a high incidence of injuries to the thoracic aorta in the fatally injured group caused by rapid deceleration of the projected rider's body against an unyielding object. A high proportion of those killed and injured were in the 17-19 year age group and most of the collisions were with cars and occurred in urban areas. Engineering solutions are suggested aimed at improving machine handling and preventing high deceleration forces being applied to the vulnerable body regions of the motorcyclist following accidental impact. Improvements in protection for the lower leg and the need for better understanding of the mechanism of brain injury which may lead to a possible improvement in helmet design are also suggested.(a) (TRRL)

Harms, PL
Transport and Road Research Laboratory, (0305-1315) Monograph TRRL SR 651, HS-032 296, 1981, 15p, 3 Fig., 11 Tab., 1 Phot., 10 Ref.

Acknowledgment: TRRL (IRRD 254630)
Order From: TRRL

342083

THE SEVERITY OF ROLLOVER CRASHES ON THE NATIONAL CRASH SEVERITY STUDY

This study of the severity of rollover crashes on the NCSS file has the primary goal of establishing a useable measure of severity for these crashes. Severity is defined as probability of occupant injury of level AIS 3 or worse. This goal is achieved with the definition of a three value ordinal scale of crash severity for passenger car rollovers having no impact prior to rollover. The scale is defined using categorical variables based on the CDC vertical extent of roof crush and the number of quarter turns of roll experienced by the vehicle. These categorical variables have a highly significant association with severe occupant injury. A model postulating the independence of effect of the variables on occupant injury severity had a highly significant fit to the data, making possible the definition of the three value crash severity scale. Low severity corresponds to the vehicle experiencing four or fewer quarter turns of roll and having CDC vertical extent of roof crush 3 or less. Medium severity corresponds to the vehicle having either 5 or more quarter turns of roll of CDC extent of roof crush 4 or more but not both. High severity is when the vehicle has both 5 or more quarter turns of roll and CDC extent of roof crush 4 or more. The validity of the choice of these variables and the resulting scale of crash severity is supported by the fact that we obtain a highly significant fit of a model predicting likelihood of occupant ejection using these variables. The case of prior impact is also analyzed and we find that a statistically significant fit to the data is obtained for a model postulating independent contributions to likelihood of occupant injury from delta-V of prior impact and from subsequent rollover.

McGuigan, R
National Highway Traffic Safety Administration HSRI 45510, HS-805 932, July 1980, 44p, 29 Tab.

Acknowledgment: National Safety Council, Safety Research Info Serv (810440 R)
Order From: National Safety Council, 444 North Michigan Avenue, Chicago, Illinois, 60611

342113

RESEARCH SAFETY VEHICLE TESTS SHOW PROMISE

Studies have demonstrated the applicability of research safety vehicle (RSV) technology. In one program, Calspan Corporation adopted a 1976 model year production car to provide enhanced safety and fuel economy. Conventional automotive sheet-metal construction was used together with high strength, low alloy steel in critical areas to reduce weight. A polyurethane front bumper facia was also incorporated in the vehicle. Another program by Minicars Inc. demonstrated new techniques of car design and construction that could be practical and economical for mass production while providing dramatic safety improvements at affordable prices, with better fuel economy and emissions. Maximum use was made of subsystems elements in order to keep the development costs as low as possible. The front end of the RSV (a) provides damage-free frontal crash protection in rigid barrier crashes, (b) dramatically reduces pedestrian impact loading at speeds up to 25 mph, (c) in frontal crashes between 10 mph and 20 mph, the bolt-on front end may be replaced with little or no repair, and (d) appreciably reduces intrusion and crash loadings on occupants of conventional cars. Other Safety features are also incorporated in the vehicle. Additional state-of-the art advances are demonstrated in the high technology RSV. Some of the advances that will soon be used by the auto industry include soft resilient foam bumpers flexible light plastic fenders, alpha/numeric driver information displays, closed loop fuel-air mixture controls, and judicious use of high strength low alloy steel.

Kossar, JM *Transportation Research News* No. 94, HS-032 602, 1981, pp 2-6, 3 Phot.

ORDER FROM: TRB Publications Off

342142

TRUCK-ACCIDENT DATA SYSTEMS: STATE-OF-THE-ART REPORT

The proceedings of a workshop which considered truck safety issues and truck safety data are summarized. The following questions were addressed: (a) What important issues should guide the collection of truck safety data? (b) What data are now available to help study those issues? (c) How good in quality and how complete are existing data, and (d) What are potential sources of additional data? The workshop considered the characteristics, trends and forecasts of truck accidents, highway environmental factors in truck accidents, and driver factors in truck accidents. There was general agreement that data valuable to heavy-truck accident causation studies do exist in a variety of sources. The task ahead is to locate, examine, and where possible, collate such data. Two important areas of data deficiency are (a) the role of economic factors in truck operations and driving practices, and (b) coarse categorization of truck accident data. Potential data sources are briefly summarized.

Transportation Research Circular No. 231, HS-032 663, Sept. 1981, 8p

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342376

EFFECTIVENESS OF CHANGEABLE MESSAGE DISPLAYS IN ADVANCE OF HIGH-SPEED FREEWAY LANE CLOSURES

The objective of the research reported herein was to determine effective advance-message presentation (e.g., display type, message content, placement distance) for lane closures on high-speed freeways. This report provides, as a result of field studies at selected lane-closure sites, an objective analysis of traffic performance in response to various changeable-message displays. Field tests were conducted at work zones in Charleston, SC; Macon, GA; Boulder, CO; and Escondido, CA. Devices that were tested included 3-line and 1-line bulb matrix signs and a 2-line rotating drum sign; data were also collected for a base condition without a sign for comparison purposes. Data collection techniques included driver questionnaires and interviews and manual recording of traffic operational data (e.g., lane change location, speed). Both right- and left-lane closure were studied, but a suitable site with a center-lane closure could not be located. Similarly, information obtained for the unplanned condition (e.g., an accident) was quite limited because of the unpredictable and short duration nature of the occurrences. The general findings from the field studies are reported herein; more detailed accounts of the results from each individual field site are included in Volume II of the agency report, "Effectiveness of Changeable Message Displays in Advance of High-Speed Freeway Lane Closures--Appendixes E-G." NCHRP Project 3-21(2) was one of many studies being conducted in the late 1970s and early 1980s related to traffic control in work zones. These studies were sponsored by the FHWA and the NCHRP and provide information on arrowboards, traffic cones, tubes, barricades, and markings. As a result, considerable information is now available on the effectiveness of individual control devices; however, there remains a need for a comprehensive study of alternative combinations of devices. (Author)

Hanscom, FR (Biotechnology, Incorporated) *NCHRP Report* No. 235, HS-032 704, Sept. 1981, 49p, Figs., Tabs., Apps.

ORDER FROM: TRB Publications Off

343667

NEW CAR ASSESSMENT SUPPLEMENTAL DATA: TASK ORDER 4

Supplemental data were collected on thirty-two New Car Assessment staged collisions. The additional data elements obtained were residual vehicle deformation consistent with the CRASH2 input format and the center of gravity acceleration of involved vehicles. From the center of gravity accelerometers, the change in velocity was determined for the test vehicles. This information is reported, along with vehicle descriptions, time of separation, time and velocities at maximum penetration, rotation, and a damage profile. Photographs of vehicle damage are also supplied.

Baum, AS

Calspan Advanced Technology Center, National Highway Traffic Safety Administration Final Rpt. CALSPAN-6525-V-102, HS-805 894, Feb. 1981, 330p, Figs., 1 Tab., 3 Ref.

Contract

DOT-HS-8-01938

ACKNOWLEDGMENT: NTIS
ORDER FROM: NTIS

PB81-226169

343681

OCCUPANT RESPONSE AND VEHICLE ACCELERATION IN A 30 MPH FRONTAL IMPACT TEST: 1981 CHEVROLET C10 CUSTOM DELUXE FLEETSIDE-PICKUP

The purpose of the effort documented herein was to acquire occupant response and vehicle acceleration in a 1981 Chevrolet C10 Custom Deluxe Fleetside-Pickup, NHTSA 810601 during a 30 mph frontal fixed barrier impact test.

Hand, DH

Approved Engineering Test Laboratories, National Highway Traffic Safety Administration Final Rpt. 971-3882-36, HS-805 918, June 1981, 97p, 16 Fig., 14 Tab., 1 App.

Contract

DOT-HS-9-02273

ACKNOWLEDGMENT: NTIS
ORDER FROM: NTIS

PB81-229338

343713

OCCUPANT RESPONSE AND VEHICLE ACCELERATION IN A 30 MPH FRONTAL IMPACT TEST: 1981 SUBARU DL-4 WHEEL DRIVE-4 DOOR WAGON

The purpose of the effort documented was to acquire occupant response and vehicle acceleration data in a 1981 Subaru DL- 4 Wheel Drive-4 Door Wagon, NHTSA 811301 during a 30 MPH frontal fixed barrier impact test.

Hand, DH

Approved Engineering Test Laboratories, National Highway Traffic Safety Administration Final Rpt. 971-3882-35, HS-805 917, June 1981, 111p, 15 Fig., 14 Tab., 1 App.

Contract

DOT-HS-9-02273

ACKNOWLEDGMENT: NTIS
ORDER FROM: NTIS

PB81-228769

343714

REVIEW AND EVALUATION OF AUTOMOTIVE FUEL CONSERVATION TECHNOLOGIES

In response to a legislative mandate to improve automotive fuel efficiency, NHTSA identified areas to be researched and analyzed to determine the costs, feasibility and impacts on various segments of the population. In all, nine tasks were completed and reported in individual reports. This final report presents a summary of the program and a brief description of the results. The reports discussed in this report include: "Passenger Car/Pedestrian Impact Protection System Evaluation", "Implementation Analysis of Brake Inspectability Requirements", "Proposed Rear View Mirror Characteristics and Costs", "Cost Analysis for Upgraded Passenger Car Rear Signal Lighting Requirements", "Vehicle Weight/Cost Optimization", "Cost and Economic Impact of Tire Reserve Load Requirements", "Implementation Analysis for Daytime Use of Headlights", "Weight and Detailed Process Cost Study of 1981 Chrysler K-Car (Reliant/Aries) Components", "Impact of Upgraded FMVSS 105 on the Economy of Operation of the 1979 LDT Fleet", "Cost, Producibility, and Feasibility Studies of Specific Automotive Systems".

Marek, S Rohter, L Viergutz, OJ

IIT Research Institute, National Highway Traffic Safety Administration
Final Rpt. T06009, HS-805 925, Mar. 1981, 138p, Figs., Tabs., 2 App.
See also report dated Dec 79, PB80-163009.
Contract

DOT-HS-9-02112

Acknowledgment: NTIS
Order From: NTIS

PB81-228777

343716

OCCUPANT RESPONSE AND VEHICLE ACCELERATION IN A 30 MPH FRONTAL IMPACT TEST-1981 FORD F150 CUSTOM EXPLORER STYLESIDE-PICKUP

The Office of Passenger Vehicle Research (OPVR) Occupant Packaging Branch (OPB) has been interested for several years in obtaining certain information on various impact modes and vehicle types through staged collisions. The information collected includes occupant injury measurements as well as seat belt loads, and vehicle acceleration.

Hand, DH
Approved Engineering Test Laboratories, National Highway Traffic Safety Administration Final Rpt. 971-3882-37, HS-805 927, June 1981, 107p, 14 Fig., 14 Tab., 1 App.
Contract

DOT-HS-9-02273

Acknowledgment: NTIS
Order From: NTIS

PB81-231045

343728

WEIGHT AND DETAILED PROCESS COST STUDY OF 1981 CHRYSLER K-CAR (RELIANT/ARIES) COMPONENTS

The objective of this task was to provide research analysis and support for implementation of fuel economy standards. Work was directed toward weight, cost, and feasibility studies of the application of alternative materials and processes or designs to automotive components or systems with a view to weight reduction. Work included: weight analysis of selected Chrysler K-Car components (Plymouth Reliant), and detailed cost analysis of selected K-Car components in original and alternative materials.

McVetty, TN Wakely, HG Viergutz, OJ
IIT Research Institute, National Highway Traffic Safety Administration
Final Rpt. T6009T07, HS-805 906, May 1981, 170p, 33 Fig., 14 Tab., 2 App.
Contract

DOT-HS-9-02112

Acknowledgment: NTIS
Order From: NTIS

PB81-232803

343739

HIGHWAY FUEL ECONOMY STUDY

In 1979, the National Highway Traffic Safety Administration (NHTSA) with support from the Federal Highway Administration (FHWA), convened a Task Force to develop a base of information on the effects of the 55 MPH speed limit. This report addresses the fuel consumption changes attributable to speed reduction and compliance with the 55 MPH speed limit. It also discusses the effects of vehicle size and type, and driver-controllable functions on vehicle fuel economy at highway speeds. Most of the analytical work in this report is related to passenger cars and light trucks. However, medium and heavy trucks, primarily commercial in application, have been included in the highway fuel economy analyses.

Mason, RL Zub, RW
Transportation Systems Center, National Highway Traffic Safety Administration Final Rpt. DOT-TSC-NHTSA-81-18, HS-805 873, June 1981, 155p

Acknowledgment: NTIS
Order From: NTIS

PB81-233850

344111

MOTOR VEHICLE COLLISIONS WITH TREES ALONG HIGHWAYS, ROADS, AND STREETS: AN ASSESSMENT

The National Transportation Safety Board has studied extensive data collected regarding vehicle collisions with trees, has investigated 19 accidents involving trees, and as a result has determined certain characteristics of such collisions. In addition, the Safety Board reviewed information supplied by seven States regarding accident data, roadside obstacle programs, and tree removal or protection programs. About 3,280 fatalities resulting from vehicle collisions with trees occur annually in the United States. NCSS data showed that vehicle accidents with trees are more severe than other frontal collisions and that when passengers fail to use restraints, fatalities may occur at speeds as low as 16 to 20 mph. The Safety Board found that few projects exist to remove or protect roadside trees, and that minimal delineation or warning signs existed at some of the accident locations. To reduce the number and severity of vehicle collisions with trees, the Safety Board has recommended implementing programs to warn motorists of the changes in roadway alignment and to protect or selectively remove roadside trees.

National Transportation Safety Board NTSB-HSS-81-1, HS-032 489, May 1981, 74p, 56 Fig., 5 Tab., 3 App.

Acknowledgment: NTIS
Order From: NTIS

PB81-211823

344258

USER GUIDE TO WARNING LIGHTS AND SIRENS FOR EMERGENCY VEHICLE WARNING SYSTEMS

The subject of visual and auditory warning devices (lights and sirens) for emergency and service vehicles is surveyed from a broad perspective. It is intended that this user guide should provide directly useful information at all levels from the selection of hardware to an understanding of the psychophysical factors determining the effectiveness of these devices. Topics covered include: the theory of warning signals; the present situation and the need for uniform national standards; suggested performance standards for warning light systems and for sirens, including the reasons for the principle requirements; recommendations for actions that can be taken to improve the signal effectiveness of emergency vehicles; an illustrated classification of the many types of emergency-vehicle warning lights; and brief summaries of some of the physical measurements that were made on a selection of lights and sirens.

Rubin, AI Howett, GL
National Bureau of Standards, National Institute of Law Enforce & Criminal Just NBS/SP-480-37, HS-032 667, May 1981, 30p, 4 Fig., 5 Tab., 11 Ref., 1 App.
Sponsored in part by National Inst. of Law Enforcement and Criminal Justice, Washington, DC. Library of Congress catalog card no. 81-600059.

Acknowledgment: NTIS
Order From: NTIS

PB81-219396

344416

AUTOMOTIVE FUEL ECONOMY-POTENTIAL IMPROVEMENT THROUGH SELECTED ENGINE AND DIFFERENTIAL GEAR LUBRICANTS

This report evaluates the effects of four engine lubricants and three differential gear lubricants on the fuel economy of two 1978 automobiles operated at 20F, 70F, and 100F ambient temperatures. The engine lubricants were evaluated using the 1978 Federal Test procedure and steady state tests from a cold start. The gear lubricants were evaluated in steady state operation from a cold start.

Naman, TM
Department of Energy, Transportation Systems Center, National Highway Traffic Safety Administration Final Rpt. DOT-TSC-NHTSA-81-8, HS-805 895, July 1981, 50p, 15 Fig., Tabs., 8 Ref., 3 App.
Contract

DOT/TSC-RA-78-19

Acknowledgment: NTIS
Order From: NTIS

PB81-240467

344422

PARENTS' KNOWLEDGE, ATTITUDES AND BEHAVIOR ABOUT CHILD PASSENGER SAFETY

Because automobile accidents are a major killer and crippler of young children in this country, Tennessee passed a child passenger protection law requiring restraint of children under four years of age in family automobiles. Passage of this law facilitated examination of parents' beliefs about child passenger safety in relation to public policy as well as public information and educational programming. From a sample of over 5,000 parents in Tennessee, data collected from almost 1,000 parents in a three-tiered procedure were analyzed. Differences between users and nonusers in knowledge and attitudes were identified, as were differences in knowledge, attitudes, and behaviors of parents at three points in time. Differences in level of use were explained in relation to predisposing factors (e.g., beliefs, including knowledge, attitudes, values, and previous behavior), reinforcing factors (e.g., physical factors such as comfort, convenience, protection, and economic benefits; psychological factors such as approval, assistance and modeling), and enabling factors (e.g., external factors such as accessibility and availability; internal factors such as skills and information processing style).

Cunningham, JL Hughes, EC Philpot, JW Pentz, CA

Tennessee University, Knoxville, National Highway Traffic Safety Administration Final Rpt. HS-805 947, May 1981, 85p, 3 Fig., 11 Tab., Refs., 3 App.

Sponsored in part by Tennessee Governor's Highway Safety Program, Nashville.

Contract

DOT-HS-7-01730

Acknowledgment NTIS

Order From NTIS

PB81-241598

344437

CHILD RESTRAINT DEVICE LOANER PROGRAMS

The child restraint device (CRD) loaner programs in Tennessee were evaluated. Interviews were conducted with loaner program clients in Memphis, Chattanooga, and Knoxville. Clients were asked their opinions in the areas of child passenger safety, health and safety, government intervention, and loaner programs; administrators were asked about program procedures with an emphasis on effectiveness and efficiency. Clients were classified by location of program, method of acquisition, CRD use status, CRD possession status, income level and interview method. Support for mandatory restraint use laws for both children and adults was higher than the rate of restraint use with either group.

Cunningham, JI Culler, CJ Pentz, CA

Tennessee University, Knoxville, National Highway Traffic Safety Administration Final Rpt. HS-805 945, June 1981, 245p, Figs., Refs., 3 App.

Sponsored in part by Tennessee Governor's Highway Safety Program, Nashville.

Contract

DOT-HS-7-01730

Acknowledgment NTIS

Order From NTIS

PB81-243651

344438

DEVELOPMENT OF A CHILD PASSENGER SAFETY COMPONENT FOR DRIVER EDUCATION PROGRAMS

As part of the Child Passenger Safety Program's comprehensive public information activities, a driver education in-service program was developed to integrate a child passenger safety curriculum unit into driver education classes. Four major school systems were selected for the in-service training. It was felt that driver education classes offered an excellent means for informing and influencing young student drivers in the area of child passenger safety. In addition to the teacher training sessions, materials for teaching child passenger safety were developed. Research and evaluation activities were conducted to assure that these materials would be appropriate for use by driver education instructors. Input from driver education instructors indicated that self-instructional materials would be more practical because of the unique classroom situation in driver education. As a result of research findings and instructor suggestions, self-instructional child passenger safety curriculum units were distributed to the four major school systems.

Munz, PM

Tennessee University, Knoxville, National Highway Traffic Safety Administration Final Rpt. HS-805 946, June 1981, 57p, 2 App.

Sponsored in part by Tennessee Governor's Highway Safety Program, Nashville.

Contract

DOT-HS-7-01730

Acknowledgment NTIS

Order From NTIS

PB81-243982

344439

A DESCRIPTIVE REVIEW OF SELECTED MASS MEDIA CAMPAIGNS ON HIGHWAY SAFETY

The National Highway Traffic Safety Administration sponsored the study to obtain information on methods for conducting mass communications programs on highway safety and to receive recommendations for future campaign activities. Twelve campaigns are reviewed on a variety of topics. Selection of campaigns for study reflect deliberate differences in scope, sponsor, level of effort, and technical approaches. Through a literature review and interviews with persons responsible for the campaigns, essential elements for campaign success are identified. Twenty-one recommendations for future highway safety campaigns are presented, 14 recommendations for preparing mass media materials are offered, and 12 recommendations regarding needed research are listed. The report also includes an annotated bibliography on the use of media for highway safety.

Swinehart, JW

Public Communication Resources, Incorporated, National Highway Traffic Safety Administration Final Rpt. HS-805 954, June 1981, 122p, 40 Tab., Refs., 2 App.

Contract

DOT-HS-9-02285

Acknowledgment NTIS

Order From NTIS

PB81-244527

344440

OCCUPANT PROTECTION/SPEED LIMIT PUBLIC INFORMATION MATERIALS CATALOG, NUMBER 3

The Occupant Protection/ Speed Limit Public Information Materials Catalog is designed for use by persons developing public information programs on those topics. It lists materials produced for campaigns, along with journal articles and reports describing and evaluating such programs.

Grimm, AC Huber, KR

Michigan University, Ann Arbor, National Highway Traffic Safety Administration Final Rpt. UM-HSRI-81-16, HS-805 940, June 1981, 108p

Contract

DOT-HS-9-02209

Acknowledgment NTIS

Order From NTIS

PB81-244907

344443

MODEL POLICE TRAFFIC SERVICES DIRECTIVES (POLICY, PROCEDURES, RULES) FOR POLICE EXECUTIVES

The National Highway Traffic Safety Administration (NHTSA) contracted with the International Association of Chiefs of Police (IACP) to conduct a series of workshops consisting of state and local law enforcement representatives having police traffic services responsibilities, designed to focus on the problems and needs of the enforcement community as they affect the delivery of police traffic services, and to provide assistance in the identification of problems and the dissemination of proposed solutions. In addition, the workshop participants were also to utilize their expertise in the merging and restructuring of two IACP publications, Highway Safety Policies for Police executives and A Manual of Police Traffic Services Policies, Procedures, Rules, into model police traffic services directives manuals suitable for adoption and use by an enforcement agency.

Sosktowski, RH Nash, WJ Mayer, RC

International Association of Chiefs of Police, National Highway Traffic Safety Administration Final Rpt. HS-805 955, July 1981, 127p, 5 App.

Contract

DOT-HS-9-02200

Acknowledgment: NTIS
Order From: NTIS

PB81-245037

344445

ALCOHOL/SAFETY PUBLIC INFORMATION MATERIALS CATALOG, NUMBER 5

The Alcohol/Safety Public Information Materials Catalog is designed for use by persons developing public information programs on alcohol and highway safety. It lists materials produced for campaigns along with journal articles and reports describing and evaluating such programs. Materials and reports listed in the catalog may be borrowed free of charge.

Grimm, AC Huber, KR
Michigan University, Ann Arbor, National Highway Traffic Safety Administration Final Rpt. UM-HSRI-81-17, HS-805 941, June 1981, 245p
See also Number 4, PB81-111478.
Contract

DOT-HS-9-02209

Acknowledgment: NTIS
Order From: NTIS

PB81-245698

344446

A REFINED TECHNIQUE FOR MEASURING MOTORCYCLE BRAKING PERFORMANCE BY THE TOW METHOD, VOLUME I: TECHNICAL REPORT

A method for measuring the braking performance of motorcycles was refined and a complete package of test hardware was constructed and demonstrated. The refined tow-test apparatus is much lighter than the original system and requires no special adaptation for testing any conventional motorcycle. In demonstration testing, performance measurements were made on three motorcycles representing the range of vehicle weights. Tests showed that the new procedures and hardware were quite satisfactory.

Ervin, RD Campbell, JD
Michigan University, Ann Arbor, National Highway Traffic Safety Administration Final Rpt. UM-HSRI-81-23-1, HS-805 958, May 1981, 190p, 43 Fig., 5 Tab., 1 App.
See also Volume 2, PB81-247934.
Contract

DOT-HS-9-02314

Acknowledgment: NTIS
Order From: NTIS

PB81-247926

344447

A REFINED TECHNIQUE FOR MEASURING MOTORCYCLE BRAKING PERFORMANCE BY THE TOW METHOD, VOLUME II: USER'S MANUAL

A method for measuring the braking performance of motorcycles was refined and a complete package of test hardware was constructed and demonstrated. The report includes a manual to instruct those who may operate the NHTSA-owned test system in the future or who may choose to reproduce the system.

Campbell, JD Ervin, RD Campbell, JA
Michigan University, Ann Arbor, National Highway Traffic Safety Administration Final Rpt. UM-HSRI-81-23-2, HS-805 959, May 1981, 86p, 20 Fig., 3 Tab., 3 App.
Contract

DOT-HS-9-02314

Acknowledgment: NTIS
Order From: NTIS

PB81-247934

344501

STEEL OPTIMIZATION AND SUBSTITUTION FOR 1980 OLDSMOBILE OMEGA X-BODY CAR

This report studies the potential of weight reduction for a 1980 Oldsmobile Omega X-body four-door sedan through steel optimization and substitution of newer steels. The study shows that 74 pounds can be removed from this vehicle using current steel technology. An additional 100-pound weight saving can be achieved through the use of newer steels in the 1990 time span.

Looby, LF
Armco, Incorporated, National Highway Traffic Safety Administration, Transportation Systems Center Final Rpt. DOT-TSC-NHTSA-81-20, HS-805 913, July 1981, 33p, 5 Tab., 8 Ref.
Contract

DTRS-57-80-P-81379

Acknowledgment: NTIS
Order From: NTIS

PB81-243792

344504

SIDE IMPACT PADDING INTEGRATION STUDY

A study was conducted to design and fabricate producible padding materials suitable for side impact thoracic protection and for installation in a modified VW Rabbit. The fabricated materials were evaluated by three test procedures; component level testing at controlled temperatures, flammability testing and HYGE sled testing. The results of these tests are presented. Upon completion of testing, the padding materials were given an overall rating based on eight evaluation factors and the superior material was identified. The evaluation criteria are discussed and the results are presented.

Monk, MW Sullivan, LK
National Highway Traffic Safety Administration Final Rpt. SRL-27, HS-805 957, Mar. 1981, 180p, Figs., 22 Tab., 3 Ref., 9 App.

Acknowledgment: NTIS
Order From: NTIS

PB81-244543

344505

TENNESSEE DUI (DRIVING WHILE UNDER THE INFLUENCE OF INTOXICANTS) PROBATION FOLLOWUP DEMONSTRATION PROJECT

The objective of the study was to assess the relative effectiveness within drinker classification of the use of probation, over and above other treatments and traditional sanctions.

Holden, RT Stewart, LT Rice, JN Manker, E
Tennessee Highway Safety Planning Division, National Highway Traffic Safety Administration Final Rpt. HS-805 950, Apr. 1981, 157p, Figs., Tabs., Refs., 9 App.
Prepared in cooperation with Traffic Safety Coordination Commission, Memphis, TN., and Nashville Urban Observatory, TN.
Contract

DOT-HS-5-01199

Acknowledgment: NTIS
Order From: NTIS

PB81-244881

344506

CONSUMER ORIENTATIONS TOWARD FUEL EFFICIENT VEHICLES: EXECUTIVE SUMMARY

This study investigates consumer reactions both to specific vehicle design changes, and more generally, to the Corporate Average Fuel Economy (CAFE) regulations and the energy supply situation which motivated their implementation.

Kernish, R
National Analysts, Incorporated, National Highway Traffic Safety Administration Final Rpt. 1-037-78-ES, HS-805 939, Mar. 1981, 25p
See also PB81-245367.
Contract

DOT-HS-7-01782

Acknowledgment: NTIS
Order From: NTIS

PB81-245359

344512

CRASH2 MAINTENANCE, VOLUME I: DESCRIPTION OF RESULTS

The document is a comprehensive report on a number of tasks related to several versions of the CRASH computer model of automobile collisions. A series of activities were performed designed to maintain, debug, and update several versions of CRASH.

Oppenheim, T
Wilson-Hill Associates, Incorporated, National Highway Traffic Safety Administration Final Rpt. 1-80-106, HS-805 948, May 1981, 250p, Figs., Tabs., 9 Ref., 4 App.
See also Volume 2, PB81-246175.
Contract

DTNH22-80-C-07110

Acknowledgment: NTIS
Order From: NTIS

PB81-246167

344526

AUGMENTATION OF RESEARCH AND ANALYSIS CAPABILITIES FOR TIMELY SUPPORT OF AUTOMOTIVE FUEL ECONOMY ACTIVITIES

A series of studies were conducted in support of the Office of Research and Development of the NHTSA in areas of automotive design and technology that could affect fuel economy. Nine such studies were carried out and included assessments of spark ignition engine; fuel economy improvement potential; potential of changes in rolling resistance, aerodynamic drag, accessory load and lubricants. Other studies included a study of the potential of alternate engines, a compilation of literature, and a preliminary assessment of diesel particulates. In addition to conducting studies based on a literature review and analysis, there were two hardware studies conducted in the form of teardown studies of selected passenger car (Ford Fairmont) and light truck (Chevy Luv) models.

Siegel, HM Schwarz, R Andon, J Gerstenbeger, T Renner, R Kececioglu, KC Morgan, W Mercer, L Cattaneo, A
South Coast Technology, Incorporated, National Highway Traffic Safety Administration Final Rpt. HS-805 956, Mar. 1981, 412p, Figs., Tabs., Phots., 5 App.
See also PB81-219479.
Contract

DOT-HS-7-01790

Acknowledgment: NTIS
Order From: NTIS

PB81-247553

344598

SIDE IMPACTS OF PASSENGER CARS: AN ANALYSIS OF FARS AND NCSS DATA

The report is one of a series devoted to the subject of side impacts as observed in several sets of available accident data. In this report, major use is made of both the Fatal Accident Reporting System (FARS) and the National Crash Severity Study (NCSS) to estimate the frequency and severity of side impacts to passenger cars. The report discusses side impacts of passenger cars and makes many comparisons between side impacts and all other collision types. Side impacts of passenger cars produce higher injury rates than do other impacts. Occupant ejection in side impacts is relatively frequent, and highly associated with injury and fatality.

Scott, RE O'Day, J Young, WE
Michigan University, Ann Arbor, Motor Vehicle Manufacturers Assn of the U.S., Inc UM-HSRI-81-20, HS-032 635, Apr. 1981, 180p, 15 Fig., 72 Tab., Phots., 1 App.
Sponsored in part by Motor Vehicles Manufacturers Association of the United States, Inc., Detroit, MI.

Acknowledgment: NTIS
Order From: NTIS

PB81-242570

344609

THE EFFECT OF CAB STYLE ON THE ACCIDENT EXPERIENCE OF HEAVY TRUCKS

Trucks and tractors of two cab styles--Conventional (with the engine forward of the driver compartment) and Cabover (with the engine below the driver compartment) are compared with respect to operational characteristics and occupant injury experience. Accident data from city, state, and federal sources are analyzed; the latter are compared with national exposure information to determine accident, injury, and fatality rates (per mile traveled). There are major differences in usage, including trip length, cargo type, cargo weight, etc. between the two different cab styles. In this study an attempt was made to measure the injury rates after controlling for such usage variations. It is concluded that injury and fatality rates derived from the Bureau of Motor Carrier Safety statistics are not different for the two cab styles, but that fatality rates derived from a combination of the Fatal Accident Reporting System and the Truck Inventory and Use Survey show the occupants of Cabovers to be at a somewhat greater risk.

Kubacki, M O'Day, J
Michigan University, Ann Arbor, Motor Vehicle Manufacturers Assn of the U.S., Inc Final Rpt. UM-HSRI-81-03, HS-032 272, Feb. 1981, 70p, 3 Fig., 33 Tab., 2 App.
Sponsored in part by Motor Vehicle Manufacturers Association of the United States, Inc., Detroit, MI.

Acknowledgment: NTIS
Order From: NTIS

PB81-241440

344623

FIELD STRENGTH MEASUREMENTS OF SPEED MEASURING RADAR UNITS

The objective of this project was to measure the microwave radiation emitted by speed measuring radar units to obtain a data base for evaluating the potential radiation hazards of these devices. Measurements were taken both in free-space and with the radar units mounted in typical operating positions inside or attached to a four-door sedan. The free-space measurements were made at four different distances to determine the field strength as a function of distance from the radar units. Calibrated radiation level probes were used to measure the field strength inside the automobile and scan the interior volume of the four-door sedan with particular attention to the driver and passenger locations. Twenty-two radar units were involved, and the data are presented in a power density format.

Baird, RC Lewis, RL Kremer, DP Kilgore, SB
National Bureau of Standards, National Highway Traffic Safety Administration Intrm Rpt. NBSIR-81-2225, HS-805 928, June 1981, 65p, 50 Fig., 1 Tab., 3 Ref., 1 App.
Contract

DOT-HS-7-01697

Acknowledgment: NTIS
Order From: NTIS

PB81-240079

345021

VEHICLE FINGERTIP REACH CONTROLS-HUMAN FACTORS RECOMMENDATIONS

Interviews were conducted with 405 drivers of cars equipped with fingertip reach controls. A high percentage of finding problems was reported when the horn was mounted on a stalk and also when the turn signal was on a right stalk. Drivers of configurations with two left stalks had a large percentage of inadvertent operation problems for the turn signal and for the headlight beam selector. A laboratory experiment was conducted to evaluate modes of operation for the wiper on/off, wiper speed and washer on/off functions. Subjects performed best when the wiper on/off and speed control were actuated by a rotating hand switch. Subjects' reactions to stalk mounted controls were much faster than their reactions to dash mounted controls. Recommendations to eliminate finding and inadvertent operation problems associated with fingertip reach controls are given.(a) (TRRL)

Moussa-Hamouda, E (De Paul University) Mourant, RR (Oakland University) *Applied Ergonomics* Vol. 12 No. 2, HS-032 672, June 1981, pp 66-70, 4 Fig., 5 Tab., 2 Ref.

Acknowledgment: TRRL (IRRD 256606)
Order From: IPC Science and Technology Press Limited, P.O. Box 63, Westbury House, Bury Street, Guildford, Surrey GU2 5BH, England

345059

HUMAN FACTORS AND HIGHWAY-ACCIDENT CAUSATION: SOME THEORETICAL CONSIDERATIONS

Traditional correlational analyses of human skills and highway accidents have not been very productive. Some of the likely reasons for this are discussed. An alternative approach to accident-causation research is outlined in which the importance of a skill with good face validity to driving is assessed in terms of its sensitivity to frequently occurring transient human states such as fatigue, stress and alcohol intoxication.(a) (TRRL)

Sivak, M (Highway Safety Research Institute) *Accident Analysis and Prevention* Vol. 13 No. 2, HS-032 442, June 1981, pp 61-64, 1 Fig., 1 Tab.,

16 Ref.
ACKNOWLEDGMENT: TRRL (IRRD 257071)
ORDER FROM: Pergamon Press Limited, Headington Hill Hall, Oxford OX3 0BW, England

345060

PATTERNS OF SAFETY BELT USAGE FOLLOWING INTRODUCTION OF A SAFETY BELT WEARING LAW

The paper reviews the process of enacting a safety belt wearing law in Israel, and studies the impact it has had on belt usage and on casualty reductions. Safety belt legislation in Israel had several unique features in that, on the one hand, all passenger vehicles were retrofitted with safety belts, but, on the other hand, it exempted drivers and front-seat passengers of pre-1969 model vehicles from the compulsory use of belts. Also, the legislation applied only to the use of belts on interurban roads. Repeated counts of safety belt usage, before and after the implementation of the law, provided strong evidence for the efficacy of the legislative act as such. Usage rates rose from an average of 6% to upward of 70%. There was a marked carryover effect of the law on belt wearing rates on urban roads and on the use by drivers of pre-1969 model cars. However, this effect diminished with time. Results of a questionnaire survey provided further evidence for the general acceptance of the law by the public. Only a small minority of drivers completely rejected the use of safety belts. A comparison with data from other countries shows that the impact of a compulsory safety belt wearing law on safety belt usage and on casualty reduction is a universal phenomenon. This fact should encourage researchers, legislators and administrators in jurisdictions which are still deliberating the value of mandatory safety belt legislation. On the basis of the trends in fatalities and casualties to car drivers and passengers on urban roads during the two and one-half year period following the introduction of the seat belt law, it is estimated that a reduction of 42% in car fatalities and 44% in car passengers occurred on interurban roads during those two and one-half years. The corresponding reductions in casualties were 18% and eight percent respectively. (a) (TRRL)

Hakkert, AS Zaidel, DM Sarelle, E *Accident Analysis and Prevention* Vol. 13 No. 2, HS-032 578, June 1981, pp 65-82, 1 Fig., 10 Tab., Refs.

ACKNOWLEDGMENT: TRRL (IRRD 257072)
ORDER FROM: Pergamon Press Limited, Headington Hill Hall, Oxford OX3 0BW, England

345061

PREDICTING WET WEATHER ACCIDENTS

The development of a wet weather safety index, WWSIE is presented. WWSIE is an empirical formulation based on prediction equations for wet accident rates. These equations were derived by multiple regression techniques from a survey of 68 highway segments in Texas. These segments covered a range of wet accident rates from zero to 40 accidents per year per mile. In general, much higher values of wet accident rates are observed in urban areas than in rural areas. Also, the sensitivity to pavement skid resistance is much higher in urban than in rural areas. The findings and developments reported warrant a restructuring of many state programs to reduce wet weather accidents. The wet weather safety index and associated equations represent a practical method of predicting wet accident rates as a function of traffic, road geometric, and pavements surface characteristics. These predictive equations may be cautiously used to determine accident reduction due to specific remedial measures. These new developments can be integrated into a comprehensive plan to reduce wet weather accidents, a plan which should greatly increase the effectiveness of those resources devoted to this objective.(a) (TRRL)

Ivey, DL Griffin, LI Newton, TM Lytton, RL Hankins, KC *Accident Analysis and Prevention* Vol. 13 No. 2, HS-032 584, June 1981, pp 83-99, 16 Fig., 5 Tab., 6 Phot., 11 Ref.

ACKNOWLEDGMENT: TRRL (IRRD 257073)
ORDER FROM: Pergamon Press Limited, Headington Hill Hall, Oxford OX3 0BW, England

345062

ROAD SIGN RECOGNITION AND NON-RECOGNITION

The problem of non-recognition of road signs has many aspects which are of great importance in traffic safety. Considering all signs on a test road and eye-movement technique and recognition rate method, a temporal analysis has been conducted for two techniques of driving: driving with the time necessary to see, read and recognize each type of road sign, and free driving to determine the actual time the driver spends reading these signs. The actual time spent provides recognition rates, totally and partially, and also rates of non-recognition. Many of the factors involved were investigated and the analysis was designed to estimate the effect of these factors separately. For a more practical use of the results, a set of probabilistic models has been estimated to characterize the different distributions of fixation durations. Next, the parameters of these models were used to develop a method for measuring the efficiency-level index of the road sign system.(a) (TRRL)

More, M Abdel-Hajim, MH *Accident Analysis and Prevention* Vol. 13 No. 2, HS-032 605, June 1981, pp 101-115, 5 Fig., 12 Tab., 20 Ref.

ACKNOWLEDGMENT: TRRL (IRRD 257074)
ORDER FROM: Pergamon Press Limited, Headington Hill Hall, Oxford OX3 0BW, England

345063

AN ESTIMATE OF THE EFFECT OF FMVSS 301-FUEL SYSTEM INTEGRITY

Federal motor safety standard no 301-fuel system integrity- was first promulgated, effective 1 January 1968. Its purpose was to reduce the fatalities, injuries and damage caused by fires occurring in automobile crashes. It was subsequently strengthened (1 September 1975 and again 1 September 1976) and extended to all four wheel vehicles of gross vehicle weight less than 10000 pounds (1 September 1976). This paper uses existing police accident and fire department data from a total of 10 states to estimate the effects of fmvss 301 on the passenger car crash population. Only very limited information on the rates of fuel spillage were found, so the paper concentrates on the rate of fires in crashes involving passenger cars. Some information on fatalities from the fatal accident reporting system (fars) is also used. Post-crash passenger car fires are rare. Reported rates ranged from less than one per thousand crashes up to nearly five per thousand crashes. Rates averaged about two fires per thousand police reported crashes or about three fires per thousand towaway crashes. Fatalities are also quite rare. In 1976, 814 persons were killed in 683 vehicles that caught fire after a crash. In 1977, 982 persons died in 858 such vehicles. Fire department data proved only of supplemental use, because a car fire could not be identified with a crash. Police accident data showed smaller post-crash fire rates with newer model year cars. While this is consistent with a beneficial effect of fmvss 301, it could also be caused by an increasing likelihood of fire in a crash for older cars. A linear trend in age for car fire rates was statistically significant only in the Illinois data. Combining the data from 6 states showed a 16% reduction in post-crash passenger car fire rates coincident with the first promulgation of the fmvss 301 in 1968. An additional 14% reduction occurred coincidently with the later version starting with the 1976 model year. A total reduction of 25% was estimated comparing pre-standard models with the current standard. These reductions were all statistically significant. While it was not possible to eliminate the possibility that aging contributed to the observed reductions, or that other factors could have influenced these reductions, it seems reasonable to conclude that some of the benefit resulted from the standard.(a) (TRRL)

Flora, JD O'Day, J *Accident Analysis and Prevention* Vol. 13 No. 2, HS-032 497, June 1981, pp 117-132, 3 Fig., 14 Tab., 6 Ref.

ACKNOWLEDGMENT: TRRL (IRRD 257075)
ORDER FROM: Pergamon Press Limited, Headington Hill Hall, Oxford OX3 0BW, England

345064

VALIDITY OF THE TRAFFIC CONFLICTS TECHNIQUE

The traffic conflicts technique was developed as a tool for estimating accident potential at intersections and for indicating methods of reducing hazardous conditions. A review of evaluation studies fails to confirm that the method can perform these tasks. This results partly from methodological problems in the studies. Differences in the definitions of both accidents and conflicts have produced results which often are incomparable simply because different pairs of variables have been used in the analyses. Other theoretical inconsistencies appear to limit the likelihood of predicting accidents from conflicts. It is suggested that a hierarchy of traffic events ranging in severity from slight conflicts to fatal accidents exists. Certain fundamental characteristics of these events (including time of occurrence, type of manoeuvre, location and probable cause) differ so markedly that the prediction of one from the other may not be possible. Evidence is presented which indicates that neither accident nor conflict data, recorded using present methods, is of much value in predicting future accidents or conflicts, respectively. It is suggested that a new method of recording conflicts which overcomes the conceptual problems of previous definitions may be useful in evaluating countermeasures at least as an experimental tool. This would require a change in the criterion used for assessing the benefits of countermeasures from one of the reduction in accidents to one of eliminating predetermined improper driving behaviour or operational problems. (a) (TRRL)

Williams, MJ (Australian Road Research Board) *Accident Analysis and Prevention* Vol. 13 No. 2, HS-032 671, June 1981, pp 133-145, 1 Fig., 7 Tab., Refs.

Acknowledgment: TRRL (IRRD 257076)

Order From: Pergamon Press Limited, Headington Hill Hall, Oxford OX3 0BW, England

345065

TRAFFIC EDUCATION FOR YOUNG PEDESTRIANS: AN INTRODUCTION

This paper introduces a collection of six detailed studies dealing with various aspects of the traffic education of young children, between 4 and 8 years of age. Young children run disproportionate risks because their developmental possibilities and skills are limited. Yet they can perform reasonably well in certain types of traffic tasks. Also they can be taught in ways that will improve both their perception and choice of safe situations and their behaviour in such situations.(a) (TRRL)

Michon, JA (Groningen University, Netherlands) *Accident Analysis and Prevention* Vol. 13 No. 3, HS-032 656, Sept. 1981, pp 163-167, 1 Fig., 6 Ref.

Acknowledgment: TRRL (IRRD 257077)

Order From: Pergamon Press Limited, Headington Hill Hall, Oxford OX3 0BW, England

345067

CHILD PEDESTRIAN'S EXPOSURE, ACCIDENTS AND BEHAVIOUR

Empirical data on children's exposure, accidents and behavior are a necessary prerequisite for the selection of the most important educational objectives, as specified in concrete form by a more theoretical "behavior requirement analysis". In this report an attempt is made to summarize the most important empirical findings in this area within the framework of a pedestrian task analysis developed earlier. The report starts with the presentation of a conceptual framework relating the concepts exposure, behavior, conflicts and accidents. The last chapter mentions several research needs which are relevant for the identification and selection of educational objectives and for the evaluation of educational and environmental countermeasures.(a) (TRRL)

Molen, HH van der (Groningen University, Netherlands) *Accident Analysis and Prevention* Vol. 13 No. 3, HS-032 433, Sept. 1981, pp 193-224, 5 Fig., 1 Tab., Refs.

Acknowledgment: TRRL (IRRD 257079)

Order From: Pergamon Press Limited, Headington Hill Hall, Oxford OX3 0BW, England

345068

CHILDREN AS PEDESTRIANS: ABILITIES AND LIMITATIONS

The purpose of this paper is to present information on the feasibility of educational objectives in the field of traffic education for young children. In order to do so, it is necessary to answer four questions. These are: (1) which behavior is desired? (2) which functions and abilities are required for a safe performance of the tasks described in question 1? On the basis of existing literature a large number of necessary functions and abilities could be distinguished. These were combined into four groups related to: the perception of oncoming traffic, judgments to be made, the decision-making process and some additional tasks. (3) how do the necessary functions and abilities develop and at what age can they be used adequately? A survey of the traffic safety literature as well as the general child development literature forms the main part of this paper. (4) what implications does this development have for the teaching objectives? The results of the literature survey show, that a great lack of relevant research does exist. The relation of most studies with the actual traffic task is often a very weak one, even within the traffic safety literature. Only a few studies have been carried out in actual traffic situations and even in these studies the relation with crossing behavior has not been studied. Hence, it is not possible at present to give a detailed set of objectives feasible at a certain age. Although some objectives can be defined, much more research is necessary before final conclusions can be reached.(a) (TRRL)

Vinje, MP (Groningen University, Netherlands) *Accident Analysis and Prevention* Vol. 13 No. 3, HS-032 435, Sept. 1981, pp 225-240, 1 Fig., 1 Tab., Refs.

Acknowledgment: TRRL (IRRD 257080)

Order From: Pergamon Press Limited, Headington Hill Hall, Oxford OX3 0BW, England

345069

THE INFLUENCE OF INSTRUCTIONAL VARIABLES ON THE EFFECTIVENESS OF TRAFFIC EDUCATION

Experiments in teaching children safe traffic behavior vary widely in objectives, methods, design and subjects. To induce generalisation of the experimental findings a model has been developed in which the factors influencing the effectiveness of the traffic training can be identified. Within the framework of this model the experimental data concerning the instructional variables are discussed in terms of instructional situations, methods and audio-visual media. Instructional situations may be divided in real traffic situations, real street situations without traffic, semi-real situations, simulated street situations and the classroom. The real traffic situation appears to be the most suitable for traffic training, whereas classroom training may be effective if certain methods are used in conjunction with audiovisual aids. The methods used in traffic training may be described as theoretical instruction, demonstrations, practical training and behavior modification. There is little evidence that theoretical instruction is effective in influencing road safety behavior. The best results seem to be obtained from demonstrations and behavior modification. Media play an increasingly important role in traffic training, the studies mainly focus on table-top models, slides, film/video and print material. The most promising results are found in experiments using film or video, especially when these films are based on demonstrations following imitation-learning principles. Finally, some conclusions are drawn concerning further research and the practical implementation of the findings.(a) (TRRL)

Rothengater, JA *Accident Analysis and Prevention* Vol. 13 No. 3, HS-032 533, Sept. 1981, pp 241-253, 1 Fig., 1 Tab., Refs.

Acknowledgment: TRRL (IRRD 257081)

Order From: Pergamon Press Limited, Headington Hill Hall, Oxford OX3 0BW, England

345070

A PARENT TRAINING PROGRAM FOR THE ROAD SAFETY EDUCATION OF PRESCHOOL CHILDREN

A main goal of the research project reported in this paper was the development and the evaluation of a road safety training program for preschool children on the basis of behavioral learning theories and empirical research findings. This training program was tested in four pilot studies with 233 children and finally evaluated with 658 children, age 3-6. With this program, parents of children between the age of 2 and 7 learn how to teach their children safe pedestrian behavior. The training program is a media package which consists of a film presenting the learning objectives and the training methods and a brochure giving concrete instructions about the training process. Both the film and the brochure describe the exercises which the parents should practice with their children directly in real traffic situations.(a) (TRRL)

Limbourg, M Gerber, D *Accident Analysis and Prevention* Vol. 13 No. 3, HS-032 575, Sept. 1981, pp 255-267, 5 Tab., Refs.

Acknowledgment: TRRL (IRRD 257082)

Order From: Pergamon Press Limited, Headington Hill Hall, Oxford OX3 0BW, England

345075

THE IDENTIFICATION OF TRAINING OBJECTIVES: WHAT SHALL WE TELL THE CHILDREN?

This discussion paper was prepared for an OECD workshop on training objectives for child pedestrians. It begins by questioning the need for such objectives, given the paucity of empirical evidence to support educational measures and the methodological problems of obtaining this evidence. It is argued that safety education should be seen as an act of faith, though one that is widely held to be both desirable and necessary. The procedures that have been used to identify training objectives are discussed in relation to three long established precepts of child pedestrian safety. It is concluded that there is no simple or universal recipe, and that it is more realistic to accept that training objectives are defined rather than identified by diligent research.(a) (TRRL)

Grayson, GB (Transport and Road Research Laboratory) *Accident Analysis and Prevention* Vol. 13 No. 3, HS-032 440, Sept. 1981, pp 169-173, 12 Ref.

Acknowledgment: TRRL (IRRD 257090)
Order From: Pergamon Press Limited, Headington Hill Hall, Oxford OX3 0BW, England

345178

DRIVERS' STEERING BEHAVIOR WHEN MEETING ANOTHER CAR: THE CASE OF PERCEPTUAL TROPISM REVISITED

A recent paper reported that, when meeting another car, drivers start turning the steering wheel left 2 sec. before the meeting, indicating, according to the author's explanation, approaching behavior due to the perceptual significance of the oncoming car. The current study was conducted to test an alternative correction-maneuver explanation. The lateral position of passing cars was recorded at several measurement points on two-lane roads, and the mean value was plotted as a function of the time from the meeting instant. The previous data on the steering-wheel angle and the current position data were compared, first on narrow and wide roads and second in car-following and open-road driving conditions. Each case involving a more pronounced steering-wheel shift to the left was found to be accompanied by a more pronounced, or sharper, lateral displacement to the right, supporting the correction-maneuver explanation.

Summala, H (Helsinki University of Technology Finland) Leino, M Vierimaa, J *Human Factors* Vol. 23 No. 2, HS-032 490, Apr. 1981, pp 185-189, 2 Fig., 4 Ref.

Acknowledgment: EI
Order From: ESL

345179

DRIVER RESPONSES TO HIGH-MOUNTED BRAKE LIGHTS IN ACTUAL TRAFFIC

This study evaluated brake responses of unsuspecting drivers to brake-signal presentations using a conventional brake-lamp system with and without supplemental high-mounted brake lamp(s). The signals were presented in actual traffic during the daytime at speeds of 48 to 72 km/h. The main finding is that the signals given by the systems with one or two supplemental high-mounted brake lamps were more likely to produce a brake response by a following driver. On the other hand, the reaction times of the brake responses did not vary between the systems.

Sivak, M Post, DV Olson, PL (Highway Safety Research Institute) Donohue, RJ (General Motors Corporation) *Human Factors* Vol. 23 No. 2, HS-032 468, Apr. 1981, pp 231-235, 1 Fig., 1 Tab., 6 Ref.

Acknowledgment: EI
Order From: ESL

345180

EFFECT OF IMPROVEMENTS IN MOTORCYCLE/MOTORCYCLIST CONSPICUITY ON DRIVER BEHAVIOR

More than 30 conspicuity treatments were developed, and the most promising ones were evaluated in day and night tests involving ordinary car drivers on public roads. The tests established which conspicuity treatments effectively deterred motorists from accepting short time gaps. Findings showed that daytime conspicuity of a motorcycle is significantly improved if (1) its normal low-beam headlamp is turned on or (2) its high-beam headlamp is turned on and is modulating in intensity three times per second or (3) the motorcyclist is wearing a high-visibility (fluorescent) vest and helmet cover. Nighttime conspicuity is significantly improved when the motorcycle uses additional running lights or the cyclist is wearing a retroreflective vest and helmet cover.

Olson, PL Halstead-Nussloch, R Sivak, M (Highway Safety Research Institute) *Human Factors* Vol. 23 No. 2, HS-032 480, Apr. 1981, pp 237-248, 2 Fig., 7 Tab., 15 Ref.

Acknowledgment: EI
Order From: ESL

345207

TRANSPORT FOR THE ELDERLY AND THE HANDICAPPED

The author discusses the rationale underlying the provision of transport for the elderly and the handicapped, the characterization of the travel patterns of the elderly and the handicapped, the principal means of transport which the elderly and the handicapped use in urban areas and their advantages and disadvantages from an economic, social and ergonomics point of view. (TRRL)

Ashford, NJ (Loughborough University of Technology, England) *Applied Ergonomics* Vol. 12 No. 2, HS-032 658, June 1981, pp 87-92, 4 Tab., 23 Ref.

Acknowledgment: TRRL (IRRD 256592)
Order From: ESL

345484

FULL SCALE POLE-TO-CAR-SIDE IMPACT TESTS-RESULTS AND SIGNIFICANCE

Side impacts of cars with poles or trees have been shown to be very hazardous to the occupants, even when seat belts are worn. This paper reviews the literature which supports the view that the worst seating positions are those centred on the line of entry of the pole. It is also demonstrated that seat belts reduce, but do not remove, the risk of death or serious injury for occupants seated on the side of the car remote from the impact, even when centred on the pole. Serious head injuries are usually sustained by those who die in pole to car side impacts. The paper describes full- scale experiments performed to determine the impact speed (which was found to be very low) necessary to produce deep penetration of the car by a pole and death to centred occupants. It is concluded that some reduction in head injuries and hence fatalities would result, for the lower speed collisions, by attention to proper shaping and padding of the interior surfaces of the car, but that relocation or modification of some roadside poles and trees is essential, if improvements are to be more extensive. Modifications of the car, for example by the addition of side door reinforcement, is shown to be of little value in reducing the hazards of pole collisions. Similarly, padding the pole had little beneficial effect (A). (TRRL)

Lozzi, A Cutting, D Herbert, DC
New South Wales Dept of Motor Transport, Australia, (0313 2854) Monograph Res Rpt. 6/80, HS-032 513, Nov. 1980, 54p, 15 Fig., 9 Tab., 28 Ref.

Acknowledgment: TRRL (IRRD 254801), Australian Road Research Board
Order From: New South Wales Dept of Motor Transport, Australia, 56 Rothschild Avenue, Roseberry, New South Wales 2018, Australia

345654

AN APPLICATION OF STEREOSCOPIC TECHNIQUES USING MOBILE HIGH-SPEED CAMERAS IN AUTOMOTIVE CRASH SIMULATION

Parallel axis stereophotography has been applied to record events of an automotive crash simulation. Two 16 mm, high frame rate, high acceleration cameras were used of the type developed for use on board military aircraft. The cameras travelled with the crashing vehicle, and were mounted on a rigid frame which was in turn attached to the floor pan of the vehicle. The crashes referred to here simulated car-to-pole side impacts. The cameras provided a stereoscopic record of events within the body shell's interior during the impact. Displacements and velocities of the anthropomorphic dummies seated in the body shell and of the intrusion caused by the pole, were determined using a single stereo photogrammetric method. Depth measurements were obtained with relative errors of about 1%, or 15 mm.(a) (TRRL)

Lozzi, A (Sydney University, Australia) Chapman, J (New South Wales Dept of Motor Transport, Australia) *International Journal of Vehicle Design* Vol. 2 No. 3, HS-032 253, Aug. 1981, pp 299-307, 6 Fig., 3 Ref.

Acknowledgment: TRRL (IRRD 257790)
Order From: Inderscience Enterprises Limited, La Motte Chambers, St Helier, Jersey, England

345699

SAFETY SPECIFICATIONS IN THE DESIGN OF VEHICLES

The author discusses the effectiveness of "active" and "passive" methods of reducing the severity of the forces and accelerations applied to vehicle occupants during the "collision phase" of an accident. Active crash protection is provided by the use of seat belts, child restraints and head restraints. The use of rear seat belts should be encouraged, particularly in developing countries where the average car occupancy is often much higher than that of European countries. It is suggested that approximately 10 per cent of all cars made will cause a serious injury or death to a road user before it is scrapped. Thus "crashworthiness" is an important design factor to be considered on a world-wide basis. Major improvements in injury reduction have been gained by the use of anti-burst door locks, high penetration resistant laminated windscreens, energy-absorbant instrument panels and anti-intrusion steering assemblies. However, there is a continuing need to evaluate the effectiveness of such measures and the controlling legislation. Current knowledge and experience from highly motorised countries should be used in the developing countries to avoid repeating mistakes. (TRRL)

MacKay, GM (Birmingham University, England) *Journal of Traffic Medicine* Vol. 9 No. 2, HS-032 628, 1981, pp 20-22, 8 Ref.

This paper was presented at a Seminar on Road Traffic Accidents arranged by the Ministry of Health, Kuwait, March 1981.

Acknowledgment: TRRL (IRRD 257774)
Order From: International Assn of Accident & Traffic Medicine, P.O. Box 10043, S-10055 Stockholm 10, Sweden

345700
MOTORCYCLE HELMETS-LAST CHANCE FOR LIFE

The repeal of the mandatory helmet law in a number of states in the USA has contributed to the substantial increase in deaths and injuries to motorcyclists over the past 20 years. It has been shown that the non-helmeted rider is twice as likely to suffer fatal injuries, and sustain more severe injuries than the helmeted rider. Fifty per cent of single vehicle and 80 per cent of multiple vehicle accidents result in serious injury or death. An adequately protective helmet should be rigid and have a strong and easily adjusted chin restraining strap. The helmet should have a good signal to noise ratio and not have accessories mounted on it. Most crashes occur within about a 40 degree forward angle. Vision is not restricted by a full face helmet with face shield reducing or preventing severe facial injury. Attempts to improve the protection of motor cyclists in crashes are not practicable because of the excess bulk involved. Strict licensing procedures or demonstrated performance has been found to decrease losses among young riders who should not only be taught how to handle the machine, but should also be shown in detail the type of crashes, the way injuries are produced and the frequency and severity of these injuries. (TRRL)

Andrews, JC *Journal of Traffic Medicine* Vol. 9 No. 2, HS-032 563, 1981, pp 22-25, 5 Fig., 3 Tab., 16 Ref.

Acknowledgment: TRRL (IRRD 257775)
Order From: International Assn of Accident & Traffic Medicine, P.O. Box 10043, S-10055 Stockholm 10, Sweden

345868
SIMPLIFIED TRANSPORT MODELS BASED ON TRAFFIC COUNTS

Having accepted the need for the development of simpler and less cumbersome transport demand models, the paper concentrates on one possible line for simplification: estimation of trip matrices from link volume counts. Traffic counts are particularly attractive as a data basis for modelling because of their availability, low cost and non-disruptive character. It is first established that in normal conditions it may be possible to find more than one trip matrix which, when loaded onto a network, reproduces the observed link volumes. The paper then identifies three approaches to reduce this under-specification problem and produce a unique trip matrix consistent with the counts. The first approach consists of assuming that trip-making behaviour can be explained by a gravity model whose parameters can be calibrated from the traffic counts. Several forms of this gravity model have been put forward and they are discussed in section 3. The second approach uses mathematical programming techniques associated to equilibrium assignment problems to estimate a trip matrix in congested areas. This method can also be supplemented by a special distribution model developed for small areas. The third approach relies on entropy and information theory considerations to estimate the most likely trip matrix consistent with the observed flows. A particular feature of this group is that they can include prior, perhaps outdated, information about the matrix. These three approaches are then compared and their likely areas for application identified. Problems for further research are discussed and finally an assessment is made of the possible role of these models vis-a-vis recent developments in transport planning. (Author/TRRL)

Willumsen, LG (University College, London) *Transportation (Netherlands)* Vol. 10 No. 3, HS-032 636, Sept. 1981, pp 257-278, 1 Fig., 1 Tab., 28 Ref.

Acknowledgment: TRRL (IRRD 257956)
Order From: Elsevier Scientific Publishing Company, P.O. Box 211, 1000 AE Amsterdam, Netherlands

346016
UPGRADE VOLVO PRODUCTION RESTRAINT SYSTEMS

A production air cushion restraint system, developed by Volvo for their 1975 Model 244, was upgraded to provide 40 mph barrier equivalent velocity (BEV) frontal impact protection for the driver and front seat passenger. The effort included a series of vehicle barrier crashes and a large amount of developmental sled testing. The 1979 Volvo 242 and 244 production seat belt restraints were also upgraded; a simple modification allowed the protection of front seat occupants at 35 mph BEV. This was again accomplished through developmental sled testing and an evaluative barrier impact.

Foster, M Broadhead, WG Zinke, DT
Minicars, Incorporated, National Highway Traffic Safety Administration Final Rpt. FR-1094-04-81, HS-805 960, Apr. 1981, 414p, Figs., Tabs.
Contract

DOT-HS-9-02178

Acknowledgment: NTIS
Order From: NTIS

PB82-101866

346018
A STATISTICAL EVALUATION OF THE EFFECTIVENESS OF FMVSS 301: FUEL SYSTEM INTEGRITY. REPORT NO. 7

This is the Final Report of the statistical evaluation of (FMVSS) 301 Fuel System Integrity. FMVSS 301 is a death-and-injury reduction Standard which includes requirements (effective 1 January 1968) on the limits of leakage from the fuel tank, filler pipes, and fuel tank connections during and after 30 mph frontal barrier crashes. The data available for analysis did not permit examining the frequency of fuel system rupture and/or fuel spillage nor the bottom line result of injury and death reduction due to FMVSS 301. The 109 post-crash fire cases available from the National Crash Severity Study file permitted a descriptive analysis by Standard period, car weight, impact site, object struck, type of collision, driver injury, etc. On the other hand, data from mid-1971 through 1978 crashes in North Carolina did permit an analysis of the effectiveness of FMVSS 301 through logistic regression procedures. The logistic regression models controlled for speed, impact site, and vehicle age within Standard status. The final model provided a negative estimate (-0.28 with a standard error of 0.143) of the effectiveness of FMVSS 301 where the effectiveness estimate represented the percentage reduction in post-crash fire rates for the Post-Standard cars (i.e., 1969-75 model year vehicles). Clearly the initial version of FMVSS 301 did not have the desired effect of reduced post-crash fire rates.

Reinfurt, DW
Center for the Environment and Man, Incorporated, National Highway Traffic Safety Administration Final Rpt. CEM-4254-679, HS-805 969, June 1981, 96p

See also Report No. 6, PB81-152241.
Contract

DOT-HS-8-02014

Acknowledgment: NTIS
Order From: NTIS

PB82-101965

346019
RESULTS OF MINICARS RSV (RESEARCH SAFETY VEHICLE) CRASH AVOIDANCE TESTS CONDUCTED IN WEST GERMANY

The report presents the results of the crash avoidance tests conducted on the Minicars RSV by Daimler-Benz AG in West Germany. The test procedures were identical to those specified in the Research Safety Vehicle program. The tests evaluated the Minicars RSV in the areas of braking, steering, handling, overturning immunity, and acceleration.

Johnson, N Davis, S
Dynamic Science, Incorporated, National Highway Traffic Safety Administration Test Rpt. 6079-80-216A, HS-805 963, Apr. 1981, 31p, 9 Fig., 8 Tab.
Contract

DOT-HS-9-02095

Acknowledgment: NTIS
Order From: NTIS

PB82-101973

346021

YOUNG DRIVER RISK-TAKING RESEARCH: THE STATE OF THE ART

The report is divided into three chapters. Chapter 1 reviews the nature of the young driver risk-taking problem, presents the purpose of the overall study and the role of the literature search in the study, outlines the literature search methodology, and notes the limitations of the search and the assessment of measurement techniques. Five explanatory hypotheses for the overrepresentation of young drivers in traffic accidents are identified and discussed in Chapter 2: driving practices of young drivers, exposure, experience, vehicle characteristics, and personality traits. Chapter 3 is devoted to the explanatory hypothesis of risk taking. Chapter 4 describes the measurement techniques identified in the review of the literature.

Hodgdon, JD   Bragg, BWE   Finn, P

Abt Associates, Incorporated, National Highway Traffic Safety Administration   Intrm Rpt.   AAI-81-68, HS-805 967, Mar. 1981, 125p, Figs., Refs., 2 App.

Contract

DTNH-22-80-C-07360

Acknowledgment: NTIS
Order From: NTIS

PB82-102021

346033

TRAFFIC OFFENDERS AND COMMUNITY SERVICE SENTENCING: AN OVERVIEW

The report presents preliminary data about the relationship between community service sentencing, traffic offenders and highway safety. Community service sentencing means that an offender is required to perform unpaid service for a governmental or non-profit organization as punishment for a traffic offense. Traffic offenders were defined in two categories: a category of serious offenses including drinking driving, reckless driving, leaving the scene of an accident, vehicular homicide, and driving while license was suspended; all other moving violations were collapsed into another category. The report covers the following material: (1) review of the literature, (2) review of the files of the national assessment of adult restitution programs to determine the experiences of these projects with traffic offenders, (3) survey of the intake of nine community service sentencing projects for the first quarter, 1980, to gather field data regarding traffic offenders served by these projects, (4) survey of judges in the nine projects to ascertain their views about the appropriateness of community service sentencing for traffic offenders, and (5) determination of whether any section 402 moneys were used to fund community service sentencing programs.

Galaway, B

Social Development Associates, National Highway Traffic Safety Administration   Final Rpt.   HS-805 968, May 1981, 89p, Tabs., Refs., 2 App.

Contract

DTNH22-80-P-05229

Acknowledgment: NTIS
Order From: NTIS

PB82-104944

346067

TEST SITE INSTRUMENTATION STUDY. VOLUME I

The study reviewed the data acquisition and reduction practices at fifteen crash and sled testing facilities which normally produce impact test data for the NHTSA. Attention was focused on dynamic response characteristics, instrumentation calibration procedures, filtering techniques, equipment properties and analog to digital conversion techniques. The results of the study indicate that significant variations occur among the test facilities. Recommendations are given for the NHTSA to standardize data acquisition and reduction methods so that the test data in the NHTSA crash test data base system will have greater consistency.

Arendt, RH   Miller, PM

MGA Research Corporation, National Highway Traffic Safety Administration   Final Rpt.   G22-V-1, HS-805 979, June 1981, 214p, Figs., Tabs., 4 Ref., 3 App.

See also Volume 2, PB82-111832.

Contract

DOT-HS-8-01936

Acknowledgment: NTIS
Order From: NTIS

PB82-111824

346068

TEST SITE INSTRUMENTATION STUDY. VOLUME II: CRASH 1 AND CRASH 2 "RAW" DATA

The study reviewed the data acquisition and reduction practices at fifteen crash and sled testing facilities which normally produce impact test data for the NHTSA. Attention was focused on dynamic response characteristics, instrumentation calibration procedures, filtering techniques, equipment properties and analog to digital conversion techniques. Presented in this volume are the "raw" data results for the Crash 1 and Crash 2 waveforms used in the Test Site Instrumentation Study.

Arendt, RH   Miller, PM

MGA Research Corporation, National Highway Traffic Safety Administration   Final Rpt.   G22-V-2, HS-805 980, June 1981, 150p

See also Volume 1, PB82-111824.

Contract

DOT-HS-8-01936

Acknowledgment: NTIS
Order From: NTIS

PB82-111832

346109

THE NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION 1980-1981 WORKSHOPS ON ALCOHOL AND OCCUPANT RESTRAINTS: EASTERN SERIES

The National Highway Traffic Safety Administration 1980-1981 Workshops on Alcohol and Occupant Restraints consisted of three series: Eastern, Central and Western. Three teaching contractors conducted the workshops for NHTSA. The National Safety Council served as logistics contractor. NHTSA's goal in sponsoring the workshops was to transfer to States and localities the technology and materials available to implement comprehensive alcohol safety and occupant restraints programs. This report discusses the Eastern Workshops, conducted by the National Public Services Research Institute, which covered twenty States (AL, CT, DE, GA, KY, ME, MD, MA, MS, NH, NJ, NY, NC, PA, RI, SC, TN, VT, VA, and WV), the District of Columbia, Puerto Rico, and the Virgin Islands. Workshop agenda and invitations were coordinated through the Offices of the Governors' Representatives for Highway Safety. Participants were drawn from the areas of adjudication, education, enforcement, health, highway safety, legislation, rehabilitation, and community support.

Perrott, J   McPherson, K   Robinson, A

National Public Services Research Institute, National Highway Traffic Safety Administration   Final Rpt.   HS-805 961, June 1981, 82p, 2 Fig., 4 Tab., 5 App.

Contract

DTNH22-80-C-25158

Acknowledgment: NTIS
Order From: NTIS

PB82-105933

346111

THE EFFECT OF THE SPEED ENFORCEMENT PROGRAM IN MASSACHUSETTS

The report contains an analysis of the impact of the 55 MPH NMSL and the 55 MPH Enforcement Program in Massachusetts from 1973-1979. Monthly fatal and injury accident data from 1970-1979 were used in the Box-Jenkins Time Series approach to estimate the number of fatal and injury accidents forestalled on 55 MPH highways. The time series approach relates changes in monthly accidents to the implementation of the NMSL and the Enforcement Program. A significant reduction in fatal accidents was found for the Enforcement Program on Massachusetts Interstate highways. Significant reductions in fatal and injury accidents were found for the NMSL on Interstate and Federal-Aid Primary highways.

Maxwell, DM

National Highway Traffic Safety Administration   Tech Rpt.   NTS-41, HS-805 977, Aug. 1981, 38p, 8 Fig., 12 Tab.

Acknowledgment: NTIS
Order From: NTIS

PB82-106717

346117

STAGED COLLISION AND DAMAGE DATA: VOLUME I. REPORT FOR ACCIDENT RECONSTRUCTION OF TWENTY FIVE (25) TEST VEHICLES (1980 MODEL YEAR)

The report contains information regarding vehicle-to-rigid barrier and moving barrier versus vehicle crash test damage and acceleration data relative to accident reconstruction. The report presents the residual crush and accelerometer traces along with other related data including post-impact photographs.

Hand, HD

Approved Engineering Test Laboratories, National Highway Traffic Safety Administration   Final Rpt.   HS-805 915, Sept. 1980, 209p, Figs.

See also Volume 1 dated Jan 81, PB81-234072 and Volume 2 dated 27 Feb. 81, PB82-109232. Portions of this document are not fully legible.
Contract

DOT-HS-9-02273

Acknowledgment: NTIS
Order From: NTIS

PB82-109224

346118

STAGED COLLISION AND DAMAGE DATA: VOLUME II. REPORT FOR ACCIDENT RECONSTRUCTION OF TWENTY FIVE (25) TEST VEHICLES (1980 MODEL YEAR)

The Accident Investigation Division (AID) of the National Center for Statistics and Analysis (NCSA) has been interested for several years in obtaining certain information on various impact modes and vehicle types through staged collisions. The information collected includes documentation of residual crush and collision deformation classification (CDC) for each vehicle in each test. Volume Two contains the vehicle-to-rigid barrier-sixteen collision tests.

Hand, DH

Approved Engineering Test Laboratories, National Highway Traffic Safety Administration   Final Rpt.   HS-805 916, Feb. 1981, 288p, Figs., Tabs., Phots.

See also Volume 1 dated 30 Sep 80, PB82-109224. Portions of this document are not fully legible.
Contract

DOT-HS-9-02273

Acknowledgment: NTIS
Order From: NTIS

PB82-109232

346121

PUBLIC ACCEPTABILITY OF HIGHWAY SAFETY COUNTERMEASURES. VOLUME I: BACKGROUND OF STUDY AND METHODOLOGY

This study provides information about public attitudes towards proposed highway safety countermeasures in three program areas: alcohol and drugs, unsafe driving behaviors, and pedestrian safety. This volume describes the three research methodologies employed in the project. First, focus group discussions were conducted to identify the nature of public concerns about, and attitudes towards, the countermeasures in order to develop a questionnaire for use in a general public survey. Second, a statistically generated sample of the general public was surveyed to produce estimates of acceptability that could be projected to the national adult population. Third, special interest case studies were conducted in each of ten states to obtain qualitative perspectives from experts in key organizations that were believed to have special interest or expertise in the countermeasure areas under investigation.

Vayda, A   Crespi, I

Mathematica Policy Research, Incorporated, National Highway Traffic Safety Administration   Final Rpt.   MPR/PRS-71-24-V1, HS-805 970, June 1981, 144p, Tabs., 3 App.

See also Volume 2, PB82-110420. Also available in set of 5 reports PC E19, PB82-110404.
Contract

DOT-HS-6-01466

Acknowledgment: NTIS
Order From: NTIS

PB82-110412

346122

PUBLIC ACCEPTABILITY OF HIGHWAY SAFETY COUNTERMEASURES. VOLUME II: SAFE DRIVING CONFORMANCE RESEARCH

This volume is part of a larger study providing information about public attitudes towards proposed highway safety countermeasures in three program areas: alcohol and drugs, unsafe driving behaviors, and pedestrian safety. Topic areas discussed in this volume include Speed Limit Acceptance, Speed Detection Methods, and Dangerous and Negligent Driving. For each proposed countermeasure, results from the public survey provide measures of opinion, acceptability, and perceived effectiveness. The relationship of various demographic factors (e.g., age, sex, education, income, etc.) to countermeasure acceptance and perceived effectiveness is also reported. Issues such as perceived effectiveness, perceived safety benefits, potential for public resistance, legal problems, and ideological perspectives emerged as the dimensions along which members of special interest groups evaluated each of the proposed countermeasures.

Vayda, A   Crespi, I

Mathematica Policy Research, Incorporated, National Highway Traffic Safety Administration   Final Rpt.   MPR/PRS-71-24-V2, HS-805 971, June 1981, 146p, Tabs., 1 App.

See also Volume 1, PB82-110412, and Volume 3, PB82-110438. Also available in set of 5 reports PC E19, PB82-110404.
Contract

DOT-HS-6-01466

Acknowledgment: NTIS
Order From: NTIS

PB82-110420

346123

PUBLIC ACCEPTABILITY OF HIGHWAY SAFETY COUNTERMEASURES. VOLUME III: ALCOHOL AND DRUG RESEARCH

This volume, part of a larger study on public attitudes towards proposed highway safety countermeasures for alcohol and drugs, unsafe driving behaviors, and pedestrian safety, discusses reactions to breath testers, drunk-driving deterrence techniques, and roadside surveys. Although not a safety strategy, roadside surveys are necessary to obtain accurate measures of drivers' impairment conditions in order to develop appropriate highway safety programs. Safety strategy acceptability issues in the public survey are presented in relation to demographic characteristics, personal drinking habits, perceived countermeasure effectiveness, and perception of the drinking-driving problem; while likelihood of participation, personal safety, validity of information obtained, and logistical factors in data collection mark the criteria for evaluating roadside surveys. Legal and liability concerns, cost and implementation issues, potential effectiveness, and perceived public opposition exemplify dimensions used by special interest group members to evaluate countermeasure strategies.

Vayda, A   Crespi, I

Mathematica Policy Research, Incorporated, National Highway Traffic Safety Administration   Final Rpt.   MPR/PRS-71-24-V3, HS-805 972, June 1981, 225p, Tabs., 2 App.

See also Volume 2, PB82-110420, and Volume 4, PB82-110446. Also available in set of 5 reports PC E19, PB82-110404.
Contract

DOT-HS-6-01466

Acknowledgment: NTIS
Order From: NTIS

PB82-110438

346124

PUBLIC ACCEPTABILITY OF HIGHWAY SAFETY COUNTERMEASURES. VOLUME IV: PEDESTRIAN SAFETY

This volume is part of a larger study providing information about public attitudes towards proposed highway safety countermeasures in three program areas: alcohol and drugs, unsafe driving behaviors, and pedestrian safety. Pedestrian safety countermeasures discussed in this volume include street safety classes for children, vendor regulations, and model parking laws. For the general public survey, acceptability issues are analyzed in terms of demographic characteristics (including age of children under 25), role of schools in safety training, perceived seriousness of the safety problem, and perceived effectiveness of the proposed countermeasure. Special interest perspectives include discussions of parental involvement in children's safety programs, implementation costs, significance of the safety problem, degree of inconvenience imposed on the public, and effectiveness in accident reduction.

Vayda, A Crespi, I

Mathematica Policy Research, Incorporated, National Highway Traffic Safety Administration Final Rpt. MPR/PRS-71-24-V4, HS-805 973, June 1981, 55p, Tabs.

See also Volume 3, PB82-110438, and Volume 5, PB82-110453. Also available in set of 5 reports PC E19, PB82-110404.

Contract

DOT-HS-6-01466

Acknowledgment: NTIS
Order From: NTIS

PB82-110446

346125

PUBLIC ACCEPTABILITY OF HIGHWAY SAFETY COUNTERMEASURES. VOLUME V: SUMMARY REPORT

This volume, part of a larger study on public attitudes towards proposed highway safety countermeasures for alcohol and drugs, unsafe driving behaviors, and pedestrian safety, is a condensation summary of the results detailed in each of the separate program-area reports. The principal issues, concerns, and reactions associated with each of the countermeasures studied are concisely summarized for quick reference; guidelines for designing countermeasure programs which engender public cooperation and support are provided; and implications of the reactions obtained are discussed.

Vayda, A Crespi, I

Mathematica Policy Research, Incorporated, National Highway Traffic Safety Administration Final Rpt. MPR/PRS-71-24-V5, HS-805 974, June 1981, 118p

See also Volume 4, PB82-110446. Also available in set of 5 reports PC E19, PB82-110404.

Contract

DOT-HS-6-01466

Acknowledgment: NTIS
Order From: NTIS

PB82-110453

346134

DRIVER LICENSE COMPACT STUDY: EVALUATION AND RECOMMENDATIONS

The purpose of this study was to review the status of the Driver License Compact. The 1960 Driver License Compact has not been revised nor updated since its enactment. There is strong evidence that the one license/one record concept is not effectively implemented. The review showed a high percentage of drivers with multiple licenses, particularly commercial drivers.

McBride, RS Jones, B

Council of State Governments, National Highway Traffic Safety Administration Final Rpt. HS-806 003, Apr. 1981, 115p, 2 Tab., Refs., 6 App.

Contract

DTNH-22-80-R-05017

Acknowledgment: NTIS
Order From: NTIS

PB82-114851

346142

EVALUATION OF FLEET MAINTENANCE DATA AS A DATA SOURCE FOR REPAIRABILITY RATINGS

This study, performed under Title II of the Motor Vehicle Information and Cost Saving Act, is an evaluation of the feasibility of using automotive fleet maintenance data as a source for vehicle make/model repairability ratings. The study involved detailed analysis of the following: the availability of fleet maintenance data including the type of data maintained, the accessibility of this data and the number of make/models represented by fleets; the cost of obtaining available data from fleets and of improving/expanding this data to support a government-sponsored rating program; and the potential biases statistical problems involved in using fleet maintenance data to ascertain vehicle make/model differences in automotive system/subsystem/component durability.

Booz-Allen and Hamilton, Incorporated, National Highway Traffic Safety Administration Final Rpt. 9073-081-002, HS-805 891, Oct. 1980, 195p, Figs., Tabs., 8 App.

Contract

DOT-HS-7-01666

Acknowledgment: NTIS
Order From: NTIS

PB82-119454

346143

CRASH PROTECTION SYSTEMS FOR HANDICAPPED SCHOOL AND TRANSIT BUS OCCUPANTS. VOLUME I. EXECUTIVE SUMMARY

A series of eight school and transit buses were subjected to nine frontal fixed barrier, two rear moving barrier and three side impact tests. Each test bus carried up to seven fully instrumented dummies-one in the driver seat, two in forward facing seats, two in side facing seats, and two in wheelchairs. The wheelchairs were secured and the wheelchair-seated dummies were restrained using commercially available restraint systems. The dummy locations, wheelchair securements, passenger restraints, crash modes and impact speeds were selected on the basis of a state-of-the-art survey and accident data analysis of operational practices and experiences with school and transit buses. The report contains the results of the state-of-the-art survey, accident data analysis and the bus crash test program. Typical deceleration crash pulses for a wide range of school bus sizes and full size transit buses are presented, as are plots of dummy trajectories and records of dummy injury measures for the selected test conditions.

Khadikar, AV Will, E

Minicars, Incorporated, National Highway Traffic Safety Administration Intrm Rpt. IR-1074-12-80-VOL-1, HS-805 821, Dec. 1980, 32p, 3 Tab.

See also Volume 2, PB82-121088.

Contract

DOT-HS-7-01774

Acknowledgment: NTIS
Order From: NTIS

PB82-121070

346144

CRASH PROTECTION SYSTEMS FOR HANDICAPPED SCHOOL AND TRANSIT BUS OCCUPANTS. VOLUME II. TECHNICAL REPORT

This is the Interim Report of the National Highway Traffic Safety Administration (NHTSA) program, "Crash Protection Systems for Handicapped School and Transit Bus Occupants" (Contract DOT-HS-7-01774).

Khadikar, AV Will, E

Minicars, Incorporated, National Highway Traffic Safety Administration Intrm Rpt. IR-1074-12-80-VOL-2, HS-805 822, Dec. 1980, 252p, Figs., Tabs., 93 Ref.

See also Volume 1, PB82-121070 and Volume 3, PB82-121096.

Contract

DOT-HS-7-01774

Acknowledgment: NTIS
Order From: NTIS

PB82-121088

346145

CRASH PROTECTION SYSTEMS FOR HANDICAPPED SCHOOL AND TRANSIT BUS OCCUPANTS. VOLUME III. APPENDICES A, B, C, AND D

The volume contains appendices A, B, C, and D to the report, including manufacturers of dummies, anthropometry, survey questions and deceleration crash pulses.

Khadikar, AV Will, E

Minicars, Incorporated, National Highway Traffic Safety Administration Intrm Rpt. IR-1074-12-80-VOL-3, HS-805 823, Dec. 1980, 39p, 4 App.

See also Volume 2, PB82-121088, and Volume 4, PB82-121104.

Contract

DOT-HS-7-01774

Acknowledgment: NTIS
Order From: NTIS

PB82-121096

346146

CRASH PROTECTION SYSTEMS FOR HANDICAPPED SCHOOL AND TRANSIT BUS OCCUPANTS. VOLUME IV. APPENDIX E

This appendix contains the test reports prepared by Dynamic Science, Inc. on crash tests conducted with two small school buses.

Khadikar, AV Will, E

Minicars, Incorporated, National Highway Traffic Safety Administration
Intrm Rpt. IR-1074-12-80-VOL-4, HS-805 824, Dec. 1980, 525p, Figs., Tabs., 2 App.
See also Volume 3, PB82-121096. Also pub. as Dynamic Science, Inc., Phoenix, AZ. report No. 4936-78-105.
Contract

DOT-HS-7-01774

Acknowledgment: NTIS
Order From: NTIS

PB82-121104

346161

PAST AND FUTURE TRENDS IN LIGHT TRUCK SALES

This report uses the Wharton EFA Motor Vehicle Demand Model (Mark II) and its associated databases to discuss and analyze past and future trends in the Light Duty Truck market. The dynamic historical growth in this market and its implications for energy, safety, and emissions policies in transportation enhance the value of increased information and understanding concerning these trends. Part A analyzes the historical trends, generally covering the 1955-77 period, its three chapters presenting and discussing data on new registrations, physical characteristics, and prices and costs. The discussion focuses on trends by manufacturer and by truck type. Part B presents preliminary projections of disaggregate truck and car sales, prices, fuel economy, etc., based upon certain economic, energy, demographic, and policy assumptions. In addition, simulation results are presented, indicating the likely impacts of changes in some of those assumptions.

Loxley, CJ Luce, P Osiecki, T Rodenrys, K

Wharton EFA, Incorporated, Transportation Systems Center, National Highway Traffic Safety Administration Final Rpt. DOT-TSC-NHTSA-80-33, HS-805 668, Aug. 1981, 125p, Figs., Tabs., 4 App.
Contract

DOT-TSC-1435

Acknowledgment: NTIS
Order From: NTIS

PB82-109059

346162

INGRESS CLEARANCE REQUIREMENTS AND SEAT POSITIONING FOR AUTOMATIC BELT SYSTEMS

The purposes of this study were (1) to determine how much clearance between a seat belt and seat cushion is needed for a driver to enter the front seat of an automobile equipped with automatic seat belts---without his/her having to lift the webbing, and (2) to derive data regarding where driver prefer to--and therefore realistically would--position themselves with relation to the steering wheel and pedal controls. Based on subjects representative of the 5th, 50th and 95th percentile, a clearance envelope for acceptable ingress/egress clearance was determined and a compliance test procedure recommended. Using these same subjects, their preferred seating positions are essentially those for which they were designed, i.e., 5th percentile females position the seat as far forward as it will go; the general 50th percentile group place the seat about midway between fore and aft extremes, and the 95th percentile males almost invariably position the seat as far aft as it will go.

Woodson, WE Selby, PH

Man Factors, Incorporated, National Highway Traffic Safety Administration Final Rpt. MFI-81-1, HS-805 982, June 1981, 32p, 5 Fig., 3 Tab., 2 App.
Contract

NRD-01-1-07288

Acknowledgment: NTIS
Order From: NTIS

PB82-109067

346163

IDENTIFICATION AND FEASIBILITY TEST OF SPECIALIZED RURAL PEDESTRIAN SAFETY TRAINING. VOLUME II: PEDSAFE ELEMENTARY MATERIALS

This report (Volume 2 of four volumes) serves as a users guide for elementary schools implementing the PEDSAFE Program. The volume contains all printed materials used in the Elementary and On-Bus PEDSAFE Programs, including Principal's Guide, Teacher's Guides, parents pamphlets, Transportation Director's Manual, and Bus Driver's Manual.

Chiplock, LW Dueker, RL Bittner, SR

Applied Science Associates, Incorporated, National Highway Traffic Safety Administration Final Rpt. ASA-619-VOL-2, HS-805 964, Mar. 1981, 319p, Figs.
See also Volume 3, PB82-109646.
Contract

DOT-HS-7-01749

Acknowledgment: NTIS
Order From: NTIS

PB82-109638

346164

IDENTIFICATION AND FEASIBILITY TEST OF SPECIALIZED RURAL PEDESTRIAN SAFETY TRAINING. VOLUME III: PEDSAFE JUNIOR/SENIOR HIGH SCHOOL MATERIALS

This report (Volume 3 of four volumes) provides detailed descriptions of all printed program materials employed in the Junior/Senior High School PEDSAFE Program. The volume is designed to serve as a users guide for school systems implementing the program. The full texts of the PEDSAFE Teacher's Guides and Student Booklets which specify program content and conduct are provided. Copies of all other printed materials are included. In addition, specifications for printing program materials are provided.

Bittner, SR Chiplock, LW Dueker, RL

Applied Science Associates, Incorporated, National Highway Traffic Safety Administration Final Rpt. ASA-619-VOL-3, HS-805 965, Mar. 1981, 345p
See also Volume 2, PB82-109638, and Volume 4, PB82-109653.
Contract

DOT-HS-7-01749

Acknowledgment: NTIS
Order From: NTIS

PB82-109646

346165

IDENTIFICATION AND FEASIBILITY TEST OF SPECIALIZED RURAL PEDESTRIAN SAFETY TRAINING. VOLUME IV: PEDSAFE AUDIOVISUAL SCRIPTS

This report (Volume 4 of four volumes) provides the scripts for all audiovisuals employed in the PEDSAFE Program. The audiovisuals produced for the PEDSAFE Program were of research quality (i.e., professional actors were not employed, camera equipment was of average quality, etc.), although the quality was such that a meaningful pilot test could be conducted. Since all audiovisuals will have to be produced professionally for full-scale implementation, this volume has been subdivided into classes of audiovisuals: those needing few script/visual modifications and those needing major modifications.

Chiplock, LW Dueker, RL Bittner, SR

Applied Science Associates, Incorporated, National Highway Traffic Safety Administration Final Rpt. ASA-619-VOL-4, HS-805 966, Mar. 1981, 135p
See also Volume 3, PB82-109646.
Contract

DOT-HS-7-01749

Acknowledgment: NTIS
Order From: NTIS

PB82-109653

346170

HEAVY TRUCK PILOT CRASH TEST ROLLOVER

A ninety-degree rollover of a tractor-trailer on its left side was accomplished. This test was performed at an approach speed of 35 mph by directing the vehicle from a straight-ahead level path onto a side slope with a nominal inclination angle to the horizontal of 55 degrees. The test vehicle, which was operated at a total weight of 35,000 pounds, carried two 50th percentile Part 572 anthropometric test devices-one unrestrained at the driver position and the other, restrained by a lap belt, at the co-driver position. Test instrumentation consisted of 33 data channels to measure vehicle accelerations, dummy acceleration and force data, and vehicle roll rate. Photographic coverage of the event was provided by one real time and eight high speed motion picture cameras. This report contains information on all aspects of the test physical characteristics of the vehicle and dummies, photographic and kinematic instrumentation, and data reduction methods. Still photographs of pre-test and post-test scenes as well as time histories of all measured vehicle and dummy responses are included.

Rice, RS
Calspan Advanced Technology Center, National Highway Traffic Safety Administration Final Rpt. CALSPAN-6748-V-4, HS-805 978, July 1981, 84p, Figs., Tabs., 2 Ref., 2 App.
Contract

DTNH22-80-C-07537

Acknowledgment: NTIS
Order From: NTIS

PB82-112459

346175

USE OF ADVERTISING AND MARKETING INCENTIVES TO PROMOTE SALES OF FUEL EFFICIENT VEHICLES, PART II

The objectives of the project were accomplished through the performance of a series of tasks. The tasks included a comprehensive literature review, the development of advertising and incentive typologies or evaluation frameworks, an evaluation of the effectiveness of advertising and promotion in the marketing of fuel-efficient cars, and the identification and description of methods to measure the effectiveness of advertising and promotion in promoting fuel efficiency as an attribute. Part II is a more detailed explanation of the background and major findings of the study.

Donnelly, JH
Market Facts, Incorporated, National Highway Traffic Safety Administration Final Rpt. HS-805 997, June 1981, 71p
See also Part 1, PB82-115627.
Contract

DTNH22-80-C-07131

Acknowledgment: NTIS
Order From: NTIS

PB82-115635

346181

IMPLEMENTATION GUIDE FOR ESTABLISHING A YOUTH TRAFFIC SAFETY COUNCIL

Given the significant overinvolvement of young drivers in highway accidents and the important influence that young people have on the behavior of their peers, an organizational framework for youth activity in highway safety is greatly needed. The Guide was prepared specifically for State and local officials interested in establishing such a framework. The emphasis of the program recommended is on youth action at the local level with the State providing support mainly through a network of communications and materials resources. The Guide contains detailed recommendations on organization, the extent of State personnel and monetary support, State and regional conferences, and specific activities that might be undertaken by local units. The recommendations are meant to allow a fairly wide latitude of application, depending upon the needs and desires of individual States.

Jacobs, G
Jacobs (Glenn) and Associates, National Highway Traffic Safety Administration HS-806 031, May 1981, 129p, 2 App.
Contract

DTNH22-81-P-07258

Acknowledgment: NTIS
Order From: NTIS

PB82-117680

346187

AN EVALUATION OF EXISTING MOTOR VEHICLE DIAGNOSTIC INSPECTION CONCEPTS, VOLUME I: EXECUTIVE SUMMARY

The study involved analysis of the characteristics of motor vehicle diagnostic inspection facilities through detailed documentation of 30 facilities and programs in the U.S., Canada and selected foreign countries. The study also focused on the characteristics of existing and planned periodic vehicle-in-use inspection programs through analysis of such programs in 31 States, the District of Columbia and the Province of British Columbia, Canada. Further, the study recommended diagnostic inspection concepts, as well as a planning manual, presenting the recommended concepts for implementation in existing and planned vehicle-in-use inspection and/or consumer assistance programs.

Booz-Allen and Hamilton, Incorporated, National Highway Traffic Safety Administration Final Rpt. 9073-103-001-VOL-1, HS-805 991, June 1981, 31p, Figs., Tabs.
See also Volume 2, PB82-119363. Also available in set of 5 reports PC E99, PB82-119348.
Contract

DTNH-22-80-C-05018

Acknowledgment: NTIS
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PB82-119355

346188

AN EVALUATION OF EXISTING MOTOR VEHICLE DIAGNOSTIC INSPECTION CONCEPTS, VOLUME II: CHARACTERISTICS OF MOTOR VEHICLE DIAGNOSTIC INSPECTION FACILITIES, TASK 1

The report documents 30 motor vehicle diagnostic inspection facilities or programs in the United States, Canada, and selected foreign countries. Comprehensive data on the 30 facilities, including layouts and architectural features, equipment, inspection hiring and training provisions, vehicle processing capabilities, quality control techniques and measures of effectiveness are contained in the appendices. The body of the report contains summary analyses of the major groups of diagnostic facilities: U.S. and Canadian auto clubs, commercial diagnostic inspection facilities, diagnostic demonstration projects, a cooperative diagnostic facility and auto clubs in Europe, Australia, and New Zealand.

Booz-Allen and Hamilton, Incorporated, National Highway Traffic Safety Administration Final Rpt. 9073-103-001-VOL-2, HS-805 992, May 1981, 399p, Figs., Tabs., 5 App.
See also Volume 1, PB82-119355 and Volume 3, PB82-119371. Also available in set of 5 reports PC E99, PB82-119438.
Contract

DTNH-22-80-C-05018

Acknowledgment: NTIS
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PB82-119363

346189

AN EVALUATION OF EXISTING MOTOR VEHICLE DIAGNOSTIC INSPECTION CONCEPTS, VOLUME III: CHARACTERISTICS OF PERIODIC VEHICLE INSPECTION PROGRAMS, TASK 2

The study involved the documentation of existing and planned vehicle-in-use inspection/maintenance programs. Summaries of administrative, staffing, facility layout, equipment types and other inspection program operational characteristics are presented for programs which provide safety, emissions, noise and fuel economy inspections in thirty-one States, the District of Columbia and the Province of British Columbia, Canada.

Booz-Allen and Hamilton, Incorporated, National Highway Traffic Safety Administration Final Rpt. 9073-103-001-VOL-3, HS-805 993, June 1981, 85p, Figs., Tabs., 3 App.
See also Volume 2, PB82-119363 and Volume 4, PB82-119389. Also available in set of 5 reports PC E99, PB82-119348.
Contract

DTNH-22-80-C-05018

Acknowledgment: NTIS
Order From: NTIS

PB82-119371

346190

AN EVALUATION OF EXISTING MOTOR VEHICLE DIAGNOSTIC INSPECTION CONCEPTS. VOLUME IV: METHODOLOGY FOR DEVELOPING THE DIAGNOSTIC INSPECTION CONCEPTS. TASK 3

This report focuses on the methodology employed in developing recommended diagnostic inspection concepts for centralized, decentralized and independent inspection programs.

Booz-Allen and Hamilton, Incorporated, National Highway Traffic Safety Administration Final Rpt. 9073-103-001-VOL-4, HS-805 994, June 1981, 48p, Figs., Tabs., 1 App.
See also Volume 3, PB82-119371 and Volume 5, PB82-119397. Also available in set of 5 reports PC E99, PB82-119348.
Contract

DTNH-22-80-C-05018

Acknowledgment: NTIS
Order From: NTIS

PB82-119389

346191

AN EVALUATION OF EXISTING MOTOR VEHICLE DIAGNOSTIC INSPECTION CONCEPTS. VOLUME V: MOTOR VEHICLE DIAGNOSTIC INSPECTION PLANNING MANUAL

The manual contains recommended concepts for the implementation of diagnostic vehicle inspection in existing and planned vehicle-in-use inspection and/or consumer assistance programs. Alternative diagnostic concepts for centralized, decentralized and independent inspection programs are presented. Detailed appendices address equipment requirements, diagnostic test procedures and facility design and architectural considerations.

Booz-Allen and Hamilton, Incorporated, National Highway Traffic Safety Administration Final Rpt. 9073-103-001-VOL-5, HS-805 995, June 1981, 223p, Figs., Tabs., 5 App.
See also Volume 4, PB82-119389. Also available in set of 5 reports PC E99, PB82-119348.
Contract

DTNH-22-80-C-05018

Acknowledgment: NTIS
Order From: NTIS

PB82-119397

346196

STATE FUNDING OF ALCOHOL SAFETY COUNTERMEASURE PROGRAMS

The study was to analyze current State practices in funding State alcohol highway safety programs. The results were intended to provide guidelines for establishing and improving self-sustaining alcohol safety programs.

Williams, RB
Human Research and Development Limited, National Highway Traffic Safety Administration Final Rpt. HS-806 032, Sept. 1979, 63p, Figs., Tabs., 4 App.
Contract

NHTSA-8-0729

Acknowledgment: NTIS
Order From: NTIS

PB82-120262

346199

IMPACT PROGRAM EVALUATION IN CONNECTICUT (55MPH)

During the period from September 1978 to March 1981 the Connecticut State Police Department participated in a demonstration project to determine the relationship between patrol level (units deployed) and motorists' compliance with the speed limit on segments of interstate highways. Phase I of the project was a pilot test of the instrumentation and procedures to be employed while Phase II involved the systematic deployment of one, two, four or six patrol units on four different highway segments. Automatic recording devices were used to continuously record the speeds of vehicles passing through the segments. The results of the study indicated that increased enforcement significantly reduced the proportion of motorists exceeding 60 mph, that more arrests per trooper were made during the increased enforcement deployments, and that fine revenues more than offset the costs of the increased patrols.

Moore, GH Ulmer, RG (Dunlap and Associates, Incorporated)
Connecticut State Police Department, National Highway Traffic Safety Administration Final Rpt. HS-806 002, June 1981, 34p, 2 Fig., 8 Tab., 6 Ref.
Contract

DOT-HS-8-02048

Acknowledgment: NTIS
Order From: NTIS

PB82-120809

346661

USE OF ADVERTISING AND MARKETING INCENTIVES TO PROMOTE SALES OF FUEL EFFICIENT VEHICLES. PART I: EXECUTIVE SUMMARY

The study illuminates how consumer acceptance of fuel-efficient automobiles is influenced by advertising and incentives. The National Highway Traffic Safety Administration (NHTSA) wishes to use the study to become more knowledgeable about the use and effectiveness of these tools in marketing automobiles, particularly fuel-efficient vehicles. The purpose of the study is to develop a basis for understanding the strengths and limitations of these marketing tools. The objectives of the project were accomplished through the performance of a series of tasks. The tasks included a comprehensive literature review, the development of advertising and incentive typologies or evaluation frameworks, an evaluation of the effectiveness of advertising and promotion in the marketing of fuel-efficient cars, and the identification and description of methods to measure the effectiveness of advertising and promotion in promoting fuel efficiency as an attribute. The executive summary provides a description of the objectives of the study, major findings and conclusions.

Donnelly, JH
Market Facts, Incorporated, National Highway Traffic Safety Administration Final Rpt. HS-805 996, June 1981, 33p
See also Part 2, PB82-115635.
Contract

DTNH22-80-C-07131

Acknowledgment: NTIS
Order From: NTIS

PB82-115627

346670

PROGRAM OVERVIEW FOR ESTABLISHING A YOUTH TRAFFIC SAFETY COUNCIL. MANUAL REPORT

Given the significant overinvolvement of young drivers in highway accidents and the important influence that young people have on the behavior of their peers, an organizational framework for youth activity in highway safety is greatly needed. The Program Overview was prepared specifically for State officials interested in establishing such a framework. The emphasis of the program recommended is on youth activity at the local level with the State providing support primarily through a network of communications and materials resources. The Program Overview contains a summary of the recommendations contained in the Implementation Guide. These recommendations relate to matters such as organization, the extent of State personnel and monetary support, State and regional conferences and specific activities that might be undertaken by local units. The recommendations are designed to be liberally interpreted and applied, depending upon the particular needs and desires of the individual States.

Jacobs, G
Jacobs (Glenn) and Associates, National Highway Traffic Safety Administration HS-806 030, June 1981, 31p
Contract

DTNH22-81-P-07450

Acknowledgment: NTIS
Order From: NTIS

PB82-121211

346680

DATA FOR VALIDATION OF CRASH VICTIM SIMULATOR

Replicate 30 MPH sled tests of a 50th percentile male anthropomorphic dummy restrained by a pre-inflated air bag and a three-point belt restraint were performed to provide data for validating mathematical simulation models of a crash victim. Special instrumentation of the dummy included triaxial accelerometers on the lower arms and 64 photographic targets attached to the dummy to permit measurement of segment motions from analysis of films from six high-speed cameras used to photograph the tests. Normal and tangential loads generated by contact of the dummy with the seat, toeboard, knee bolster and air bag reaction panel were also measured.

DeLeys, NJ
Calspan Advanced Technology Center, National Highway Traffic Safety Administration Final Rpt. CALSPAN-6197-V-1, HS-806 049, Aug. 1981, 422p, 20 Fig., 4 Tab., 9 Ref., 8 App.
Contract

DOT-HS-7-01660

ACKNOWLEDGMENT: NTIS
ORDER FROM: NTIS

PB82-123720

346686

REPORT ON A NATIONAL STUDY OF PRELIMINARY BREATH TEST (PBT) AND ILLEGAL PER SE LAWS: EFFECTIVENESS OF PBT AND IPS LAWS

The report provides information for use by state governments or traffic safety organizations interested in obtaining passage of either PBT or IPS in their states to control DWI offenses. The report sets forth the laws currently in effect and describes experiences with these laws in a sample of IPS and PBT jurisdictions, and discusses issues that would normally be addressed in a legislative analysis of alternative statutory approaches to control DWI traffic offenses. These include basic arguments for and against PBT and IPS, a description of practical, legal and constitutional issues, anticipation of special interest group concerns, the attitudes of police, prosecutors, judges, and defense attorneys, and a sample of before and after traffic safety and BAC statistics. The presentation of study findings and documentation of recommendations also include the tactical issues associated with obtaining support for these bills in the legislature. The report includes model statutory language and supporting rationale for an IPS and PBT law that should be acceptable to most state legislatures, and provides sample jury instructions, based upon those that have proven to be satisfactory in states with IPS and PBT statutes. The report also incorporates the results of a two-day NHTSA sponsored workshop attended by national authorities on IPS/PBT laws.

Macdonald, D Wagner, M
Science Applications, Incorporated, National Highway Traffic Safety Administration Final Rpt. SAI-1-103-08-091-00, HS-806 048, Aug. 1981, 179p, 8 Tab., 1 App.
Contract

DTNH22-80-C-05000

ACKNOWLEDGMENT: NTIS
ORDER FROM: NTIS

PB82-124389

346698

DEVELOPMENT OF TIRE INTERMIX PERFORMANCE AND INSPECTION SYSTEM. VOLUME I: EXECUTIVE SUMMARY

A tire intermix classification system, based on measured side force properties of individual designs, was developed and validated to improve on current industry recommendations utilizing categories of construction type (cord orientation) and section size ratios. The system predicts intermix-caused changes in a vehicle's understeer gradient at a mid-performance cornering operating point. Based on prohibiting differentials exceeding 3 deg/g, this system proved more effective in limiting unacceptable intermix than the current recommendations. Seventy-eight passenger car tire designs were laboratory tested and analyzed during this program; 42 radials, 21 bias belted, and 15 bias ply. Wide differences in cornering compliance were found among tires of the same construction type and size. Validation field tests were conducted on three vehicles to compare predicted changes in understeer (due to cornering compliance) with that actually measured. The results support the recommendations for a system based on a maximum allowable differential in classification numbers which could be stamped on individual tires.

Hogue, JR Szostak, HT Klein, RH
Systems Technology, Incorporated, National Highway Traffic Safety Administration Final Rpt. STI-TR-1144-1-I, HS-805 983, Apr. 1981, 41p, 5 Fig., 7 Tab., 10 Ref.

See also Volume 2, PB82-126913. Also available in set of 3 reports PC E14, PB82-126897.

Contract
DOT-HS-9-02131

ACKNOWLEDGMENT: NTIS
ORDER FROM: NTIS

PB82-126905

346699

DEVELOPMENT OF TIRE INTERMIX PERFORMANCE AND INSPECTION SYSTEM. VOLUME II: TECHNICAL REPORT

This report comprises Volume II of a three-volume technical report documenting a project to derive and validate a system to identify potentially unsafe tire mixes. This volume provides a technical background, a derivation of a proposed tire mix classification system, and a detailed description of the laboratory tire tests and vehicle field validation tests, together with a presentation of the results from these tests. It also presents conclusions and recommendations based on these test results.

Hogue, JR Szostak, HT Klein, RH
Systems Technology, Incorporated, National Highway Traffic Safety Administration Final Rpt. STI-TR-1144-1-II, HS-805 984, Apr. 1981, 217p, Figs., Tabs., 6 App.

See also Volume 1, PB82-126905, and Volume 3, PB82-126921. Also available in set of 3 reports PC E14, PB82-126897.
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DOT-HS-9-02131

ACKNOWLEDGMENT: NTIS
ORDER FROM: NTIS

PB82-126913

346700

DEVELOPMENT OF TIRE INTERMIX PERFORMANCE AND INSPECTION SYSTEM. VOLUME III: LABORATORY TIRE TEST DATA

This report comprises Volume III of a three-volume technical report documenting a project to derive and validate a system to identify potentially unsafe tire mixes. This Volume provides the tire test data as received from laboratory testing at Calspan.

Hogue, JR
Systems Technology, Incorporated, National Highway Traffic Safety Administration Final Rpt. STI-TR-1144-1-III, HS-805 985, Apr. 1981, 105p, 4 Fig., 10 Tab.

See also Volume 2, PB82-126913. Also available in set of 3 reports PC E14, PB82-126897.
Contract

DOT-HS-9-02131

ACKNOWLEDGMENT: NTIS
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PB82-126921

346713

INDEX OF THE RELATIVE IMPORTANCE OF FUEL EFFICIENCY (IFE) IN THE MOTOR VEHICLE MARKET

The need for the National Highway Traffic Safety Administration to understand the importance of vehicle fuel economy in the marketplace has created the requirement for a quantitative measure of consumer attitudes toward fuel efficiency. This paper surveys the currently available measures of consumer attitudes toward fuel efficiency, concludes that they do not adequately meet NHTSA's needs, and develops the Index of the Relative Importance of Fuel Efficiency (IFE) to fill this void.

Hallaq, JH Schaeffer, KH Westenberg, D
Transportation Systems Center, National Highway Traffic Safety Administration Final Rpt. DOT-TSC-NHTSA-81-24, HS-806 029, Oct. 1981, 41p, 4 Fig., 8 Tab., 2 App.

ACKNOWLEDGMENT: NTIS
ORDER FROM: NTIS

PB82-130204

346754

A COMMUNITY MODEL FOR HANDLING HAZARDOUS MATERIALS AND TRANSPORTATION EMERGENCIES. FINAL REPORT ON PHASE 1

The report develops models for local communities for handling hazardous materials transportation emergencies and puts them into a separate manual in step-by-step "how to" format. The models were tested on two communities, at each end of their intended population range. The models were easy to apply and appeared to give reasonable and meaningful results. A review of a sample of 27 states' laws leads to the conclusion that states are currently wrestling with the many facets of the problem but there is no unity.

Russell, ER Smaltz, JJ Lambert, JP Deines, VP Jepsen, RL
Kansas State University, Department of Transportation Final Rpt. DOTRSPA/DPB-50-81/30, Oct. 1981, 538p
Contract

DOT-RC-92013

Acknowledgment: NTIS
Order From: NTIS

PB82-131640

346755

CRASH PROTECTION SYSTEMS FOR HANDICAPPED SCHOOL BUS OCCUPANTS. VOLUME I. EXECUTIVE SUMMARY

A series of sled tests were conducted to determine the influence of five major parameters on the occupant protection of handicapped school bus passengers. The selected parameters were bus crash pulse, dummy size, wheelchair orientation, wheelchair securement type and passenger protection system. In the tests, both ambulatory and wheelchair seated occupants were simulated with anthropomorphic dummies, and padding and belt systems were evaluated in both large and small school buses. The parameters were established via baseline bus crash tests, a state of the art survey, and an accident data analysis. The present report describes the results, and analyses of the results, which show the influence of each parameter on occupant protection. The results provide a data base that could be effectively used in designing complete passenger protection systems for handicapped passengers in school buses.

Khadikar, AV Will, E Costa, V
Minicars, Incorporated, National Highway Traffic Safety Administration Final Rpt. FR-1074-03-81-VOL-1, HS-805 826, Mar. 1981, 33p
See also Volume 3, PB82-131756.
Contract

DOT-HS-7-01774

Acknowledgment: NTIS
Order From: NTIS

PB82-131749

346756

CRASH PROTECTION SYSTEMS FOR HANDICAPPED SCHOOL BUS OCCUPANTS. VOLUME III. APPENDICES

The objectives of the program were to identify and document lifts, ramps, tiedowns/securement systems and other ingress and egress hardware that has been used in the transportation of handicapped passengers-further, to critically evaluate the available hardware to assess its impact on the convenience and safety of the handicapped occupant during operational and crash situations; to compile, analyze and evaluate existing accident data involving handicapped occupants in order to ascertain specific causes of injuries and deaths; and to identify the injury causing hardware and mechanisms.

Khadikar, AV Will, E Costa, V
Minicars, Incorporated, National Highway Traffic Safety Administration Final Rpt. FR-1074-03-81-VOL-3, HS-805 828, Mar. 1981, 354p, Figs.
See also Volume 1, PB82-131749.
Contract

DOT-HS-7-01774

Acknowledgment: NTIS
Order From: NTIS

PB82-131756

346765

RISK ASSESSMENT/VULNERABILITY USERS MANUAL FOR SMALL COMMUNITIES AND RURAL AREAS. REPORT ON PHASE 1

The primary objective of this handbook is to present guidelines for communities below 50,000 in population and for rural areas in assessing risk from hazardous materials transportation and vulnerability to potential incidents. The procedure offers guidance for determining an organizational structure appropriate for a particular level of risk and vulnerability. These plans hopefully can greatly minimize the immediate danger to life in the initial stages of a hazardous materials incident. A secondary objective is to keep the procedures simple and easy to use. The manual emphasizes a "how to" approach.

Russell, ER Smaltz, JJ Lambert, JP Deines, VP Jepsen, RL
Kansas State University, Department of Transportation DOTRSPA/DPB-50-81/29, Oct. 1981, 100p
Contract

DOT-RC-92013

Acknowledgment: NTIS
Order From: NTIS

PB82-135849

347732

PROFILES OF AUTOMOTIVE SUPPLIERS INDUSTRIES-ENGINEERED MECHANICAL COMPONENTS AND SYSTEMS: VOLUME I, TEXT

This profile describes and analyzes that segment of the automotive supplier industry which provides engineered mechanical components/assemblies/-systems to the prime auto manufacturers. It presents an overview of the role and structure of this industry and of its historical business performance data (1975 through 1979). It profiles, in some detail, 76 leading companies in this industry, and discusses domestic and foreign changes and growing international competition. It provides an assessment of capital requirements, of structural changes in the industry, and of evolving suppliers' strategy and tactics.

Kaldobsky, PR Fava, NE
Transportation Systems Center, National Highway Traffic Safety Administration Final Rpt. DOTTSC-NHTSA-81-21-1, HS-805 975, Sept. 1981, 433p, 18 Tab.
See also Volume 2, PB82-129511.

Acknowledgment: NTIS
Order From: NTIS

PB82-129503

347733

PROFILES OF AUTOMOTIVE SUPPLIERS INDUSTRIES-ENGINEERED MECHANICAL COMPONENTS AND SYSTEMS: VOLUME II, APPENDICES

The profile describes and analyzes that segment of the automotive supplier industry which provides engineered mechanical components/assemblies/-systems to the prime auto manufacturers. It presents an overview of the role and structure of this industry and of its historical business performance data (1975 through 1979). It profiles, in some detail, 76 leading companies in this industry, and discusses domestic and foreign changes and growing international competition. It provides an assessment of capital requirements, of structural changes in the industry, and of evolving suppliers' strategy and tactics.

Kaldobsky, PR Fava, NE
Transportation Systems Center, National Highway Traffic Safety Administration Final Rpt. DOTTSC-NHTSA-81-21-2, HS-805 976, Sept. 1981, 189p, Tabs.
See also Volume 1, PB82-129503.

Acknowledgment: NTIS
Order From: NTIS

PB82-129511

347741

ALTERNATIVE SIGN SEQUENCES FOR WORK ZONES ON RURAL HIGHWAYS. EXECUTIVE SUMMARY

The report summarizes the results of two experiments, sponsored by the FHWA and carried out at the Maine Facility, which examined the effectiveness of several alternative sign sequences for warning motorists on a two-lane rural road that there are construction/maintenance activities ahead which require closure of one lane. Types of signs tested include typical MUTCD warning signs, flasher augmented signs, and symbol signs. Principal findings concluded that flasher augmented signs were most effective in slowing approaching motorists and symbol signs were always at least as effective as the typical warning signs with word messages.

Lyles, RW
Maine Department of Transportation, Maine University, Federal Highway Administration Final Rpt. FHWA-RD-80-162, HS-032 252,

May 1981, 19p, 5 Fig., 3 Tab., 4 Ref.

Prepared in cooperation with Maine Univ. at Orono. Social Science Research Institute. See also PB82-132820.

Contract

DOT-FH-11-9401

ACKNOWLEDGMENT: NTIS
ORDER FROM: NTIS

PB82-132812

347884

IMPROVEMENTS IN TRANSPORTATION FIRE SAFETY DATA BASES

The existing statistical data bases for transportation system accidents have been designed primarily to fulfill the modal administrative reporting functions. As such, the data collected are of a very broad nature and of limited use in the identification of areas of possible research and in the development and measurement of the effectiveness of regulatory action. This report identifies the design objectives which fire safety data bases should address, and provides recommendations for improvements in transportation fire safety data bases. A review of the available data bases containing information on transportation fires is presented in Reference 1.

Hathaway, WT
Transportation Systems Center Final Rpt. DOT-TSC-OST-81-7, Dec. 1981, 28p, Refs.

ACKNOWLEDGMENT: NTIS
ORDER FROM: NTIS

PB82-142043

347897

THE TRANSPORTATION OF NON-NUCLEAR HAZARDOUS MATERIALS, ISETAP TASK FORCE MEETING

This report is a summary of the June 1980 Task Force meeting to discuss their problems with managing the transportation of hazardous materials. Thirty-three representative of industry, shipping and government were represented at this meeting. Regulation, enforcement, training, and especially intergovernment coordination were the key issues raised by the participants.

Intergovernmental Sci, Eng & Technology Adv Panel, Department of Transportation Summ Rpt. DOT-I-80-46, June 1980, 53p

ACKNOWLEDGMENT: NTIS
ORDER FROM: NTIS

PB82-149568

347899

THE EFFECT OF LIGHT TRUCK DESIGN VARIABLES ON TOP SPEED, PERFORMANCE, AND FUEL ECONOMY, 1981

The effect of vehicle weight, rolling resistance, aerodynamic drag, and drive-line configuration on fuel economy and performance for light duty trucks is examined. The effect of lockup and extended gear ratio range is also investigated. The assessment of these vehicle variables on fuel economy and performance is determined by using the Transportation Systems Center's vehicle simulation program, VEHSIM, which predicts fuel economy and performance for vehicle parameter changes. The results indicate fuel economy and performance trends which can be used to project future improvements.

Zub, RW Meisner, RP
Transportation Systems Center, National Highway Traffic Safety Administration Final Rpt. DOT-TSC-NHTSA-81-22, HS-806 047, Nov. 1981, 103p, Figs., Tabs., 15 Ref., 3 App.

ACKNOWLEDGMENT: NTIS
ORDER FROM: NTIS

PB82-150426

347920

COMPARISON OF SIGNS AND MARKINGS FOR PASSING/NO-PASSING ZONES

Overtaking and passing maneuvers are two of the most common sources of conflict between two or more vehicles on two-lane, two-way rural roads. While the signing and marking of passing/no-passing zones has received considerable attention there is still a lack of consensus relative to the effectiveness of the various methods, how they should be used, and what the enforcement policies should be. In this context, the research effort reported on herein was directed to the evaluation of several alternative methods for marking/signing of passing and no-passing zones in rural two-lane situations.

Lyles, RW
Maine University, Maine Department of Transportation, Federal Highway Administration Final Rpt. FHWA-RD-81- 95, HS-032 619, Aug. 1981, 40p, 2 Fig., 10 Tab., Ref.
See also PB82-162603.
Contract

DOT-FH-11-9401

ACKNOWLEDGMENT: NTIS
ORDER FROM: NTIS

PB82-162504

347921

COMPARISON OF SIGNS AND MARKINGS FOR PASSING/NO-PASSING ZONES. EXECUTIVE SUMMARY

The report reviews an experiment undertaken to examine the relative effectiveness of five pavement marking/signing sequences for informing motorists of passing and no-passing zones on rural two-lane roads. Treatments examined included: (1) standard pavement markings; (2) pavement markings plus standard regulatory signing; (3) pavement markings plus no-passing pennants; and (4) and (5) two combinations of regulatory signs and pennants. Data were collected on overtaking/passing vehicles by two observers in a staged vehicle that traveled over a measured length of roadway. The principal findings were that the addition of any sign sequence to pavement markings resulted in motorists being both more observant of passing and no-passing zones and spending less time in the passing (opposing) lane. Less conclusive evidence was presented in support of the more emphatic/informative sequences resulting in progressively more compliance with the marked zones.

Lyles, RW
Maine University, Maine Department of Transportation, Federal Highway Administration FHWA-RD-81- 94, HS-032 618, Aug. 1981, 12p, 1 Fig., 2 Tab., Refs.
See also PB82-162504.
Contract

DOT-FH-11-9401

ACKNOWLEDGMENT: NTIS
ORDER FROM: NTIS

PB82-162603

348022

THE FEASIBILITY OF A MOTORCYCLE DAYTIME "LIGHTS-ON" REGULATION--A DISCUSSION PAPER

This paper discusses some of the issues concerning the use of lights during the daytime by motorcycles. It is noted that, with certain provisions, it is possible to implement either a light usage regulation or a vehicle design rule to increase light usage rates. Either regulation should prove an effective accident countermeasure with a high chance of being cost beneficial. (Author)

Wynne-Jones, JD *Traffic Research Circular* No. 16, 1981, v.p., Figs., Tabs., Refs., Apps.

ORDER FROM: Ministry of Transport, New Zealand, Traffic Research Section, Private Bag, Wellington, New Zealand

348128

THE USE OF RELATIONSHIPS BETWEEN ROAD ACCIDENTS AND TRAFFIC FLOW IN "BLACK-SPOT" IDENTIFICATION

This paper summarises some recent research to determine the form and strength of the relationships between accidents and traffic, and gives examples of the applications of the findings. Data from the Lothian Regional Council accident statistics system, comprising some 3250 junctions and 7250 links are used in the analysis. Junctions are categorised in terms of physical configuration and form of traffic control. Analysis of variance calculations show that this categorisation of junctions leads to an improvement in the ability to predict accident totals. High levels of significance were found between junction category and the average and annual accident totals, the accident rate and the traffic throughput and root product flow. It is suggested that a ranked black-spot listing can be produced by using traffic indices to determine expected accident totals for each location. A factor representing the measure of the potential accident reduction can be calculated for each location. Those locations with a factor higher than a pre-determined threshold value can then be selected and placed in order. (TRRL)

McGuigan, DRD *Traffic Engineering and Control* Vol. 22 No. 8/9, HS-032 669, Aug. 1981, p 448, 2 Fig., 3 Tab., 7 Ref.

ACKNOWLEDGMENT: TRRL (IRRD 259203)
ORDER FROM: Printerhall Limited, 29 Newman Street, London, England

348129

SPEEDS ON TWO-LANE RURAL ROADS-A MULTIPLE REGRESSION ANALYSIS

This paper presents regression equations for the effects of the human factor, the mechanical factor, the traffic factor and the environment on the average journey speed as well as the 85th and 95th speed percentiles. The effects of road geometry were not studied since they have already been extensively examined. Results show that, for light vehicles, the effects of driver's age and sex was significant. Average speeds decreased with increasing age and male drivers travel faster than female drivers. It was also found that there was a substantial influence of the type of land use near the roads on speeds. Speeds in low-density residential areas were lower by at least 10 km/h than those on similar roads in agricultural and wooded areas. Weather also was found to have a significant effect on speed. Speeds on a dry roadway in fine weather were higher than on a wet surface and on a cloudy day. Results also showed that movements in platoons had a significant effect on reducing speed, but the effect of total flow in either direction was not significant. The proportion of trucks in the observed lane had a significant effect in slowing down speed, as did the proportion of trucks in the opposite lane. Significant reductions in speed occurred with vehicle age, whilst car speeds increased significantly with engine size. (TRRL)

Galin, D *Traffic Engineering and Control* Vol. 22 No. 8/9, HS-032 645, Aug. 1981, pp 453-460, 1 Fig., 8 Tab., 13 Ref.

ACKNOWLEDGMENT: TRRL (IRRD 259204)
ORDER FROM: Printerhall Limited, 29 Newman Street, London, England

348354

NEW MEXICO'S COMPUTERIZED ACCIDENT RECORDS SYSTEM

The paper describes the development, implementation and operation of the New Mexico Computerized Accident Records System. A two-three year pilot project conducted by the Middle Rio Grande Council of Governments under the guidance of a broad-based technical committee was adapted to meet statewide needs. Various considerations placed the state-level operation in the State Police Department under joint poweres agreements. Implementation took place under the guidance of, and continuing operations are monitored by, a user-type committee. The result has been to give New Mexico one of the most complete and accurate data bases in existence in the Nation.

Kingsbury, DC (New Mexico State Police)
New Mexico University, Albuquerque 1981, pp 325-327
Proceedings of the Paving Conference, 18th, University of New Mexico, Albuquerque, New Mexico, January 7-9, 1981.

ACKNOWLEDGMENT: EI
ORDER FROM: ESL

348355

IDENTIFYING HIGHWAY PROBLEMS USING ACCIDENT RECORDS

Accident records have given the transportation engineer the ability to analyze, review and identify highway problems. Highway safety can be improved by implementing countermeasures in the three general categories of the vehicle, the driver and the roadway. The countermeasures relating to thee roadway include the installation of safety features, such as regulatory and warning signs, guardrails, breakaway signs and light supports, bridge widenings, slope and shoulder work and various construction techniques. The accident records are used to relate accident location to roadway characteristic and are being incorporated into the ratings for highway construction improvements. It is one of the factors to be considered for analyzing the specific deficiencies on road systems. In addition, they may be used to detect some particular problems for certain areas; for example, rate increases or decreases, by counties.

Larranaga, LA (New Mexico State Highway Department)
New Mexico University, Albuquerque 1981, pp 328-330
Proceedings of the Paving Conference, 18th, University of New Mexico, Albuquerque, New Mexico, January 7-9, 1981.

ACKNOWLEDGMENT: EI
ORDER FROM: ESL

348356

FATAL ACCIDENT SITE ANALYSIS

While there is little doubt that driver error in one form or another is the primary cause of virtually all automobile crashes, it is equally apparent that the resultant severity of certain types of accidents can be reduced through the application of improved design concepts and the development and use of a formal "clear roadside" policy for new highways as well as existing facilities. This paper examines specific fatal accident sites in New Mexico to determine what design changes should be made to reduce accident severity at these and similar locations in the future, and to suggest priorities for safety up-grading of existing facilities.

Powers, RD (Federal Highway Administration)
New Mexico University, Albuquerque 1981, pp 332-336
Proceedings of the Paving Conference, 18th, University of New Mexico, Albuquerque, New Mexico, January 7-9, 1981.

ACKNOWLEDGMENT: EI
ORDER FROM: ESL

348357

HIGHWAY-RELATED TRAFFIC ACCIDENT STUDY ON THE LAGUNA AND ACOMA INDIAN RESERVATION VALENCIA COUNTY, NEW MEXICO

This paper presents the results of an extensive study of highway-related accidents reported on the Laguna and Acoma Indian reservations in Valencia County, New Mexico between July 1977 and December 1979. The study was conducted to compare traffic accidents on the reservations with other traffic accidents in Valencia County. The study analyzed traffic accident experience with respect to selected crash characteristics, including road character, road condition, road defects, road surface, road grade, lighting, weather, reporting agency, and accident classification. The findings of the study indicate that the characteristics of traffic accidents on the Laguna and Acoma Indian reservations differ significantly from those on other highways in Valencia County. The research also found that accident severity was dependent on road surface, character, lighting, classification, and grade, while it was independent on road defects, condition, and weather.

Vigil, JO
New Mexico University, Albuquerque 1981, pp 337-352, 10 Ref.
Proceedings of the Paving Conference, 18th, University of New Mexico, Albuquerque, New Mexico, January 7-9, 1981.

ACKNOWLEDGMENT: EI
ORDER FROM: ESL

348364

HEAVY TRUCK SAFETY. . . THE NEED TO KNOW

The purpose of this paper is to review what is known about the causes of heavy truck accidents and to suggest what steps might be undertaken to help in reducing heavy truck accidents, injuries and fatalities.

Krall, FL Rossow, GW *Traffic Quarterly* Vol. 35 No. 3, July 1981, pp 337-358, 11 Ref.

ACKNOWLEDGMENT: EI
ORDER FROM: ESL

348423

ANTHROPOMETRY STUDY OF SWEDISH ENGINE DRIVERS

The selection of measurements was made with respect to their ergonomic relevance for the design of the cab in the Swedish Rapid type c (Rc) engine. Anthropometric measurements were obtained from 150 engine drivers and 91 driver trainees. The results indicated that, on average, the future engine driver was taller than the present population of engine drivers. The results also showed that engine drivers and driver trainees do not notably differ in stature from other groups of men in Sweden. There were marked differences between the body size of engine drivers and the corresponding dimensions of the cab in the Rc engine. The compartment seemed to be best suited to taller drivers and was too large for smaller drivers.

Hedberg, GE (Natl Board of Occup Saf & Health Umea, Sweden) Bjorksten, TM Ouchterlony-Jonsson, KE Jonsson, B *Ergonomics* Vol. 24 No. 4, HS-032 744, Apr. 1981, pp 257-264, 4 Fig., 5 Tab., Refs.

Acknowledgment: EI
Order From: ESL

348545

AUSTRALIAN CODE FOR THE TRANSPORT OF DANGEROUS GOODS BY ROAD AND RAIL

The code was prepared by the standing National Advisory Committee on the Transport of Dangerous Goods, and is endorsed by the Australian Transport Advisory Council. It is designed to apply to all surface land transport in Australia and forms a basis for commonwealth and state legislation. It stipulates package marking and envisages a packaging approval system which incorporates a package marking readily available to and recognisable by the various regulatory authorities. The code consists of 2 parts. Part 1 contains all the detailed requirements under sections relating to definitions, classification of dangerous goods, markings of packages, containers and vehicles, documentation, packaging of dangerous goods, carriage in bulk of liquids and liquefied bases, stowage and compatibilities, transport procedures. Part 2 consists of an index of dangerous goods and sets out in tabular form the relevant information necessary for transport. (TRRL)

Commonwealth of Australia Gazette No. P16, Dec. 1980, 380p, Figs., Tabs.

Acknowledgment: TRRL (IRRD 254956), Australian Road Research Board
Order From: Australian Government Publishing Service, 109 Canberra Avenue, Griffith, A.C.T., Australia

348569

PSYCHOLOGICAL AND SOCIAL LOSSES FROM ROAD TRAFFIC CRASHES

This report reviews literature, primarily from psychiatric research, that indicates the type of emotional or psychological after-effects likely to be experienced by road crash victims which might represent losses to individuals and the community. The report indicates possible measures for mitigation of these losses, and extends the context in which cost-benefit analyses of the road transport mode are conducted. The report finds that traffic crashes may have real and significant psychological effects which are protracted, and wide ranging. These effects are revealed through a number of signs and symptoms in victims: increased mortality, increased morbidity, disrupted relationships, altered lifestyles, and numerous psychopathological syndromes. Modern psychological techniques of crisis intervention offer practical and effective means to reduce these losses. At present, little support of this kind appears available to traffic crash victims in Australia. (Author/TRRL)

Hart, D Linklater, D
New South Wales Dept of Motor Transport, Australia, (0313-2854) Research Rpt. 2/81, HS-032 738, May 1981, 58p, 2 Tab., 65 Ref.

Acknowledgment: TRRL (IRRD 254886), Australian Road Research Board
Order From: New South Wales Dept of Motor Transport, Australia, 56 Rothschild Avenue, Roseberry, New South Wales 2018, Australia

348727

DRIVER EDUCATION: PART OF THE SOLUTION OR PART OF THE PROBLEM

In many states, the minimum driving age is reduced by as much as two years for those teenagers who take driver education in high school. By increasing the number of teenage drivers, this has the ironic effect of actually creating more teenage accident victims, as shown in a Connecticut study comparing communities with and without driver education. On the other hand, teenagers who have taken driver education have fewer traffic violations than those who do not. Since the blame is not on the course itself but its timing, delaying driver education a year or two may be the best solution.

Journal of American Insurance Vol. 57 No. 3, 1981, pp 1-5, Figs.

Order From: University Microfilms International, 300 North Zeeb Road, Ann Arbor, Michigan, 48106

348728

NHTSA'S CHILLING FORECAST: 70,000 TRAFFIC DEATHS BY 1990

The National Highway Traffic Safety Administration has issued a report, "Traffic Safety Trends and Forecasts", which predicts that fatalities will rise from the current 50,000 per year to 70,000 by 1990. The report notes that fatalities per million miles of travel have declined significantly in recent years, from 5.7 in 1966 to 3.4 in 1980, due to such factors as improved roads, reduced speeds and stricter law enforcement. However, in the coming decade, this trend will be counteracted by other factors contributing to an increase in fatalities: changes in vehicle mix (a greater precnetage of smaller and lighter vehicles), an increase in the number of licensed drivers deu to a growing population, an increase in vehicle miles per driver, possible repeal of the 55 mph speed limit, increase usage of motorcycles, mopeds and bicycles, and an increase in pedestrian facilities.

Journal of American Insurance Vol. 57 No. 3, 1981, pp 9-10, 2 Fig.

Order From: University Microfilms International, 300 North Zeeb Road, Ann Arbor, Michigan, 48106

348729

MARIJUANA AND HEALTH

This report is divided into eight chapters and a summary. The summary includes the principal findings and conclusions of the study, together with suggestions for future research. The first chapter reviews what is known about the chemistry and pharmacology of marijuana. Chapter 2 deals with the epidemiology and demography of the use of marijuana in the United States. The next three chapters discuss the effects of marijuana on cells, tissues, organs, and biological systems. Chapter 6 deals with behavioral and psychosocial effects. Chapter 7 discusses the present status of marijuana as a therapeutic agent. Chapter 8 describes and analyzes the federal research program on marijuana. (Author)

Institute of Medicine, NAS/NRC 1982, 188p, Figs., Tabs., Refs., Apps.
Report of a Study by a Committee of the Institute of Medicine, Division of Health Sciences Policy.

Order From: National Academy of Sciences, 2101 Constitution Avenue, NW, Office of Publications, Washington, D.C., 20418

348743

A BEHAVIOURAL CAR-FOLLOWING MODEL FOR COMPUTER SIMULATION

The ability to predict the response of a vehicle in a stream of traffic to the behaviour of its predecessor is important in estimating what effect changes to the driving environment will have on traffic flow. Various models proposed to explain this behaviour have different strengths and weaknesses. This paper constructs a new model for the response of the following vehicle based on the assumption that each driver sets limits to his desired braking and acceleration rates. The parameters in the model correspond directly to obvious characteristics of driver behaviour and the paper goes on to show that when realistic values are assigned to the parameters in a simulation, the model reproduces the characteristics of real traffic flow.

Gipps, PG (CSIRO Division of Building Research, Australia) *Transportation Research. Part B: Methodological* Vol. 15B No. 2, HS-032 425, Apr. 1981, pp 105-111, 3 Fig., 6 Ref., 1 App.

Acknowledgment: National Highway Traffic Safety Administration
Order From: Pergamon Press Limited, Headington Hill Hall, Oxford OX3 0BW, England

348744

ACCIDENTS OF MOTOR CARRIERS OF PROPERTY 1979

This publication presents an annual compilation of "reportable accidents" submitted by motor carriers of property operating in interstate or foreign commerce, to the Federal Highway Administration's Bureau of Motor Carrier Safety (BMCS). The term "reportable accident" means an occurrence involving a motor vehicle operated by a motor subject to the Federal Motor Carrier Safety Regulations resulting in: (a) the death of a human being; (b) bodily injury to a person who, as a result, receives medical treatment away from the scene of the accident, or (c) total damage to all property aggregating $2,000 or more based on actual cost or reliable estimates. The information has been compiled from 35,541 accident reports filed by motor carriers of property during the calendar year 1979. Various types of empirical data relating to accidents are reported: fatalities, injuries, property damage and accident type.

Federal Highway Administration HS-032 422, 1981, 66p, Phots.
ACKNOWLEDGMENT National Highway Traffic Safety Administration
ORDER FROM GPO

348745

THE ASTM TEST MONITORING SYSTEM--PURPOSE AND OPERATION

The purpose of the Test Monitoring Center (TMC), created in 1973, is to establish, maintain and operate a system for assuring that the Lubricating Oil Engine Test Procedures, published in the American Society for Testing and Materials (ASTM) Special Technical Publication (STP) 315, "Multicylinder Test Sequences for Evaluating Performance of Crankcase Lubricants" are conducted properly. TMC is not involved in engine oil approvals. Its basic contribution is to calibrate engine test stands and/or engine test laboratories as prescribed by the specific ASTM test procedure via reference oils to provide authenticity to the results from commercial oils run in-between reference oil runs. Also the Society of Automotive Engineers Lubricants Review Institute's (SAE LRI) Review Committee independently utilizes TMC reference oil data in evaluating candidate oils for approval by the Military. TMC's operation is detailed and further expansion possibilities are discussed.

Colyer, CC (Amoco Chemicals Corporation) *ASTM Standardization News* Vol. 9 No. 10, HS-032 421, Oct. 1981, pp 8-12, 1 Phot.

ACKNOWLEDGMENT National Highway Traffic Safety Administration
ORDER FROM American Society for Testing and Materials, 1916 Race Street, Philadelphia, Pennsylvania, 19103

348746

STATISTICS '80 OF ROAD TRAFFIC ACCIDENTS IN JAPAN

This statistical report of road accident statistics in Japan, contains the following topics: (A) Road Traffic Situation, 1946-1980; (B) Traffic Accidents: Trends; (C) Traffic Accidents and Casualties in 1980: (1) Traffic Accidents in 1980; (2) Fatal Accidents in 1980; (3) Casualties in 1980; (4) Child Casualties in 1980; (5) Traffic Accidents on Expressways; (D) Control of Traffic Violations; (E) Traffic Regulations and Controls; (F) Driver's License; (G) Reference Information.

International Association of Traffic & Safety Sci HS-032 419, No Date, 57p

ACKNOWLEDGMENT National Highway Traffic Safety Administration
ORDER FROM International Association of Traffic & Safety Sci, 6-20, 2-chome, Yaesu, Chuo-ku, Tokyo 104, Japan

348747

BEDROCK PROOF OF PERFORMANCE IS DETROIT'S '82 CRITERION

The article reviews the utilization of various plastic materials in automobile construction. Molded polycarbonate is used in body panels and other exterior automotive parts. RRIM-nylon is being tested by General Motors' Manufacturing Development Center for exterior panels with a view to a production part by 1984. Research is conducted on low-profile sheet moulding compound (SMC) to try to remedy appearance problems that compromise its wholehearted acceptance by the automobile industry. Trend is toward lighter weight low-profile SMC and BMC (bulk moulding compound) without tradeoff of physical properties.

Wood, AS *Modern Plastics* Vol. 58 No. 10, HS-032 424, Oct. 1981, pp 46-49, Phots.

ACKNOWLEDGMENT National Highway Traffic Safety Administration
ORDER FROM McGraw-Hill, Incorporated, 1221 Avenue of the Americas, New York, New York, 10020

348748

THE APPLICATION OF ROAD SAFETY COUNTERMEASURES IN DEVELOPING COUNTRIES

Various examples of major differences between countries are used to emphasize the point that the order of priorities in road safety programs in developing countries can, more often than not, be very different from that in industrialized countries. As a consequence, there is a need to evaluate any countermeasures that are undertaken by mounting local or regional trials and carefully monitoring their cost-effectiveness before using them nationally. This then indicates the further and fundamental need for a good accident data collection analysis system, sufficient to produce essential information for accident investigation purposes, but not too sophisticated either for the needs or abilities of those needed to operate or contribute to it. A program of cooperative road safety research under the aegis of the Overseas Unit of the Transport and Road Research Laboratory and the Egyptian Ministries of Transport and Interior is outlined.

Hills, BL (Transport and Road Research Laboratory) Jacobs, GD *Traffic Engineering and Control* Vol. 22 No. 8-9, HS-032 423, Aug. 1981, pp 464-468, 2 Fig., 4 Tab., 22 Ref.

ACKNOWLEDGMENT National Highway Traffic Safety Administration
ORDER FROM Printerhall Limited, 29 Newman Street, London, England

348749

WERE YESTERDAY'S SMALL CARS 30 YEARS TOO SOON? (OR HOW HISTORY REPEATS ITSELF)

As prices of gasoline soared, and import sales in the United States skyrocketed, sales of Detroit cars fell off horrendously. General Motors, Ford and the Chrysler Corporation went on a small car spree with the X-cars, the Ford Escort, the K-cars and now the J-cars. However, small fuel-efficient cars are not new and many of them got high-mileage before the U.S. Government's edict ordering Detroit to make cars with higher mileage per gallon. A brief description of these and other cars from 1900 to present times is given. The article includes a table giving length and wheelbase comparisons of some of the old small cars, the new ones and the imports.

Janicki, E *California Highway Patrolman* Vol. 45 No. 6, HS-032 364, Aug. 1981, pp 22-26, 16 Phot.

ACKNOWLEDGMENT National Highway Traffic Safety Administration
ORDER FROM California Association of Highway Patrolmen, P.O. Box 2631, Sacramento, California, 95812

348750

TRANSPORTATION ENERGY CONTINGENCY PLANNING

This Information Bulletin addresses the short-term issues and what can be done by local officials in advance to prepare for a sudden petroleum shortage. Chapter 1 presents the issues and problems. A brief background review is followed by a discussion of methods to reduce fuel consumption before a crisis, including increasing automobile occupancy, increasing use of van pools, increasing taxi occupancy, increasing transit bus efficiency, and adjusting travel patterns. Plan preparation is dealt with, including the selection of strategies, organizing to implement the strategies, and financing the plan. Chapter 1 concludes by pointing out lessons that have already been learned from others such as Wilkes-Barre, Pennsylvania and its handling of transportation congestion after Hurricane Agnes, and the Los Angeles handling of an intense petroleum shortage during the 1973 oil embargo. Chapter 2 lists contacts and current programs and chapter 3 presents an annotated bibliography. A summary of the New York City transit strike is contained in Appendix A and Appendix B is a chart showing key issues with summaries of transportation energy contingency plans devised to deal with them.

Public Technology, Incorporated, Department of Transportation HS-032 362, Sept. 1980, 52p, 2 Fig., 3 Tab., 2 App.

A Report of the Transportation Task Force of the Urban Consortium for Technology Initiatives.

ACKNOWLEDGMENT National Highway Traffic Safety Administration
ORDER FROM GPO

348751

JAPANESE GOVERNMENT WHITE PAPER ON TRANSPORTATION SAFETY '81, PRIME MINISTER'S OFFICE

This work comprehensively presents for Japan the situation regarding traffic accidents primarily focused on 1980, the studies of traffic safety measures instituted in fiscal 1980, and the plans for traffic safety measures scheduled to be implemented in fiscal 1981. It covers highway, railway, marine and aviation traffic. Deaths caused by road traffic accidents in Japan have steadily decreased for nine years since 1971. In 1980, however, the number of fatalities showed a 3.5% increase over the preceding year. There was also a slight increase in the number of accidents and in the number of people injured. The traffic safety measures and preventive countermeasures outlined are being initiated with the goal of stopping this trend toward an increase in accidents.

International Association of Traffic & Safety Sci HS-032 420, 1981, 239p, Figs., Tabs.

ACKNOWLEDGMENT National Highway Traffic Safety Administration

ORDER FROM: International Association of Traffic & Safety Sci, 6-20, 2-chome, Yaesu, Chuo-ku, Tokyo 104, Japan

348752

WHY HIGHWAY DEATHS ARE CLIMBING AGAIN

The highway death toll is again on the rise and appears to be approaching the record 56,278 killed in 1972. The problems behind this increase are clear: an epidemic of drunk driving, mass disregard of speed limits, widespread failure to use seat belts and other restraints, the mix of more smaller cars with ever bigger trucks, and lagging highway maintenance. Steps are being taken at both federal and state levels to combat these situations, but thus far it has been a losing battle.

Thornton, J *US News and World Report* Vol. 61 No. 11, HS-032 366, Sept. 1981, pp 69-71, 3 Phot.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: US News and World Report Incorporated, 2300 N Street, NW, Washington, D.C., 20037

348753

WHERE STATE GOVERNMENTS STAND ON 55-M.P.H. LEGISLATION

A review of state government legislation involving speed limits reveals that 26 states have pending legislation aimed at ending the 55 mph speed limit, while 3 states have bills pending which would strengthen it. A recent Gallup poll indicated 3 out of 4 Americans favor retaining the national 55 mph speed limit law. Of great concern is the President's budget cuts which would eliminate $40 million for enforcement assistance to the states. Various statistics are given which reveal the impact of the 55 mph speed limit on fatalities and on energy, and in conclusion the consequences of raising the limit are considered.

Hurley, C *Traffic Safety* Vol. 81 No. 3, HS-032 367, May 1981, p 8

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: National Safety Council, 444 North Michigan Avenue, Chicago, Illinois, 60611

348754

WHAT PRICE SAFETY? FACING THE MORAL DILEMMAS

Highway safety engineers and transportation administrators are increasingly being faced with ethical and philosophical dilemmas surrounding trade-offs between the public good and public savings. This article considers the various questions that highway safety engineers and transportation administrators must face in making or influencing these cost benefits decisions. From a pragmatic standpoint, the answers appear obvious, since all programs would halt if decision makers challenged each project and expenditure, but from the moral or ethical standpoint, the answers are not so clear.

Taylor, JI (Notre Dame University) *Traffic Safety* Vol. 81 No. 5, HS-032 365, Sept. 1981, p 6

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: National Safety Council, 444 North Michigan Avenue, Chicago, Illinois, 60611

348755

USE OF AUTOMOBILE RESTRAINING DEVICES FOR INFANTS

Use of crash-tested and approved restraining devices for infants was studied in relationship to parent's locus of control, knowledge scores, and demographic data. Of 66 mothers who provided complete data, 19 (29 percent) owned and made proper use of the devices. Thirty-four mothers (52 percent) owned devices but did not use them properly.

Ford, AH (Kaiser Permanente Medical Group) *Nursing Research* Vol. 29 No. 5, HS-032 363, Sept. 1980, pp 281-284, 1 Tab., Refs.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: American Journal of Nursing Company, 10 Columbus Circle, New York, New York, 10019

348756

"THE HUMAN COLLISION", INTERNATIONAL SYMPOSIUM ON OCCUPANT RESTRAINT, JUNE 1-3, 1981, TORONTO, ONTARIO, CANADA

The goal of this Symposium was to assemble, from a medical perspective, the knowledge currently available worldwide about motor vehicle occupant restraint. The Proceedings contain the papers presented at the Symposium, grouped according to the following six topical areas: (I) Medical and social perspectives of occupant restraint; (II) Seat belt effectiveness; (III) Mandatory seat belt laws and enforcement; (IV) Automatic restraints; (V) Special needs of infants, children and the handicapped; and (VI) Occupant restraint: an overview.

Green, RN, Editor Petrucelli, E, Editor
American Association for Automotive Medicine Proceeding HS-032 368, 1981, 252p

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: American Association for Automotive Medicine, P.O. Box 222, Morton Grove, Illinois, 60053

348757

THE MEDICAL SIGNIFICANCE OF OCCUPANT RESTRAINT ON ROAD CRASH VICTIMS AND THOSE WHO TREAT THEM

There is now undisputed world wide evidence that properly adjusted occupant restraints substantially reduce the severity of injury to vehicle occupants in road crashes. The past decade has shown that an acceptable high wearing rate can only be achieved by mandatory wearing laws. A high wearing rate of 85-90% for drivers and front seat passengers has been maintained in Victoria ten years after laws were first introduced. The Royal Australasian College of Surgeons and the American Association for Automotive Medicine consider there is no categorical evidence for medical exemption from seat belt usage. Few injuries of significance are due directly to belt wearing and there is no evidence that seat belts offer any special risk to occupants. The achievements of the Royal Australasian College of Surgeons in tackling the road trauma problem over the past eleven years stresses the important role physicians in general and surgeons in particular must play in the development and promotion of road safety programmes directed at preventing road crashes, reducing the effects of crashes and providing a high standard of medical care.

Trinca, GW (Royal Australasian College of Surgeons)
American Association for Automotive Medicine Proceeding HS-032 369, 1981, pp 3-13, 2 Tab., 26 Ref.

"The Human Collision", International Symposium on Occupant Restraint, June 1-3, 1981, Toronto, Ontario, Canada.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: American Association for Automotive Medicine, P.O. Box 222, Morton Grove, Illinois, 60053

348758

THE EFFECT OF SEAT BELT USE ON THE DEMAND FOR MEDICAL SERVICES

In a study of 3,361 occupant victims of motor vehicle accidents in Southeastern Ontario, the demand for medical services and the rehabilitation requirements were measured. Comparison of the requirements for medical services and rehabilitation time by restrained and not-restrained occupant victims identifies that an impressive proportion of them is reducible by seat belt use.

Dagnone, LE Siu, TO (Queen's University, Canada)
American Association for Automotive Medicine Proceeding HS-032 370, 1981, pp 14-23, 2 Ref.

"The Human Collision", International Symposium on Occupant Restraint, June 1-3, 1981, Toronto, Ontario, Canada.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: American Association for Automotive Medicine, P.O. Box 222, Morton Grove, Illinois, 60053

348759

STATE LEGISLATION AND OCCUPANT RESTRAINT

A state government incurs many direct expenses as a result of highway accidents which occur in the state. These include state support of hospitals where treatment of injury has not been otherwise paid for, sick leave for state employees unable to work because of accidents, insurance premiums for state agencies and educational institutions, uncompensated damage to highways and highway furniture, aid to dependent children whose dependence resulted from automobile accidents, etc. State legislators have opportunities to enact laws which may directly affect either the likelihood of accidents or the likelihood of injury given an accident. This study, using data mainly for the State of Michigan, estimates such state expenditures, and provides examples of models to compute the potential costs and savings to the state which would result from legislation.

O'Day, J (Highway Safety Research Institute)
American Association for Automotive Medicine Proceeding HS-032 371, 1981, pp 24-29, 4 Tab., 6 Ref.

"The Human Collision," International Symposium on Occupant Restraint, June 1-3, 1981, Toronto, Ontario, Canada.

Acknowledgment: National Highway Traffic Safety Administration
Order From: American Association for Automotive Medicine, P.O. Box 222, Morton Grove, Illinois, 60053

348760

EFFECTIVENESS OF OCCUPANT RESTRAINTS IN REDUCING INJURIES & FATALITIES

Studies on restraint effectiveness in the USA indicate that lap-shoulder belts are effective in reducing fatalities, as well as serious and critical-to life injuries to occupants of passenger cars. Estimates of the effectiveness of passive systems also indicate a marked reduction in the more serious injuries and fatalities.

Huelke, DF (Highway Safety Research Institute)
American Association for Automotive Medicine Proceeding HS-032 372, 1981, pp 33-38, 2 Fig., 6 Tab., 7 Ref.

"The Human Collision", International Symposium on Occupant Restraint, June 1-3, 1981, Toronto, Ontario, Canada.

Acknowledgment: National Highway Traffic Safety Administration
Order From: American Association for Automotive Medicine, P.O. Box 222, Morton Grove, Illinois, 60053

348761

SEAT BELTS IN EUROPE--THEIR USE AND PERFORMANCE IN COLLISIONS

The early development of seat belts in Europe is reviewed to show how they evolved from relatively primitive accessories to an integral part of the modern car's design. Legal requirements on fitting and use of seat belts worldwide are summarised briefly, and actual belt usage rates in the traffic stream and in collisions are discussed. The effectiveness of seat belts in minimising injury in different collision configurations is outlined from the literature and comment is made on the risks of neck injury from belts. Overall it appears that universal belt use will prevent at least half of all car occupant deaths and serious injuries. Future developments in seat belts are mentioned and pre-loading appears as the most beneficial next stage. In general terms a mandatory usage law, coupled with effective education and enforcement is a successful policy, but if for political reasons such a policy is impossible, then passive seat belts offer an attractive alternative in the long term.

Mackay, GM (Birmingham University, England)
American Association for Automotive Medicine Proceeding HS-032 373, 1981, pp 39-54, 3 Fig., 4 Tab., 28 Ref.

"The Human Collision," International Symposium on Occupant Restraint, June 1-3, 1981, Toronto, Ontario, Canada.

Acknowledgment: National Highway Traffic Safety Administration
Order From: American Association for Automotive Medicine, P.O. Box 222, Morton Grove, Illinois, 60053

348762

REFINEMENTS OF RESTRAINT SYSTEM DESIGN--A PRIMARY CONTRIBUTION TO SEAT BELT EFFECTIVENESS IN SWEDEN

The development of safety belts in Sweden from the beginning in the mid 1950s is reviewed. Both the history of regulations and the development of various belt designs are dealt with. It is found that the creative cooperation between Government agencies and industry as well as the continuous work to improve the belt wearing comfort have been advantageous to the effectiveness of safety belts in Sweden. The latest data on occupant fatalities in Sweden as well as recent findings from VOLVO accident studies are summarized. One of the VOLVO analyses shows that the rear seat is as dangerous as the front seat. The other report concludes that 74% of the injuries sustained by truck occupants in accidents with commercial vehicles can be mitigated by the use of a 3-point belt. Volvo has therefore developed a special truck safety belt which has been introduced as standard equipment on some truck models.

Bohlin, NI (Volvo Car Corporation)
American Association for Automotive Medicine Proceeding HS-032 374, 1981, pp 55-72, 18 Fig., 23 Ref., 1 App.

"The Human Collision", International Symposium on Occupant Restraint, June 1-3, 1981, Toronto, Ontario, Canada.

Acknowledgment: National Highway Traffic Safety Administration
Order From: American Association for Automotive Medicine, P.O. Box 222, Morton Grove, Illinois, 60053

348763

SEAT BELTS AND TRAFFIC SAFETY: THE CANADIAN EXPERIENCE

This paper reviews the effects of Canadian seat belt laws on the use of occupant restraints as well as on concomitant changes in mortality and morbidity. Whereas the frequency of wearing increased only at the time legislation was enacted, it has decreased over time since then. Associated reductions in mortality and morbidity have been difficult to identify in the macro evaluations conducted to date, although effects in terms of reduced injury severity have been reported with reasonable consistency. It is clear that initiatives are required if wearing rates are to be increased to the levels achieved immediately after the law was enacted. While enforcement is viewed as one such logical measure, it is suggested that alternative strategies need to be considered.

Simpson, HM Warren, RA (Traffic Injury Research Foundation of Canada)
American Association for Automotive Medicine Proceeding HS-032 375, 1981, pp 73-83, 4 Fig., 25 Ref.

"The Human Collision", International Symposium on Occupant Restraint, June 1-3, 1981, Toronto, Ontario, Canada.

Acknowledgment: National Highway Traffic Safety Administration
Order From: American Association for Automotive Medicine, P.O. Box 222, Morton Grove, Illinois, 60053

348764

RESTRAINT SYSTEMS AND THE LAW

Mandatory legislation in regard to occupant restraint in many jurisdictions is briefly reviewed and compared. Mandating seat belt use has been shown in many jurisdictions to be the most effective immediate way of significantly reducing death and severe injuries resulting from motor vehicle collisions. Historically tort law has played an important role in deterring certain types of conduct. It appears that if the common law continues to develop by itself, the seat belt defence will be increasingly recognized by the courts in assessment of contributory negligence. If seat belt defence is to be recognized by law, such statutes should be broad rather than restrictive to provide just penalty for unreasonable behaviour on the part of an individual by which he contributes to injuries caused him by someone else's negligent acts.

Green, RN (Western Ontario University, Canada) Sharpe, GS (McMaster University, Canada)
American Association for Automotive Medicine Proceeding HS-032 376, 1981, pp 87-97, 22 Ref.

"The Human Collision", International Symposium on Occupant Restraint, June 1-3, 1981, Toronto, Ontario, Canada.

Acknowledgment: National Highway Traffic Safety Administration
Order From: American Association for Automotive Medicine, P.O. Box 222, Morton Grove, Illinois, 60053

348765

LAWS ON MANDATORY SEAT BELT USE AND THEIR ENFORCEMENT IN THE FEDERAL REPUBLIC OF GERMANY

In the Federal Republic of Germany nearly 100 per cent of private motor vehicles are now equipped with front seat safety belts; since 1 May 1979, new motor vehicles also have to be equipped with safety belts on the back seats. As from 1 January 1976, safety belt usage is mandatory; there is no punishment, however, if the belt is not worn, and there are also no police controls. If an accident occurs when the belt is not worn this leads to a reduction of the claim for damages. Mandatory safety belt usage is compatible with the constitution of the Federal Republic of Germany. At present the belt usage rates are: 80% on motorways, 65% on regular roads, and 45% within built-up areas. In the night the rates are lower; if there is a passenger in the car, the rates are higher. The reduction factor for a usage rate of 100 per cent is estimated as follows: approximately 3,600 fatalities (motor vehicle drivers and passengers) less approximately 70,000 injured drivers and passengers. An increase of the usage rate by 1% only would mean 40 fatalities less. Negative consequences of seat belt usage can be found in 1% of the cases at the most. If a fine is introduced for not wearing the belt, no difficulties are expected with regard to police control.

Seidenstecher, K (Federal Ministry of Transport, West Germany)

American Association for Automotive Medicine Proceeding HS-032 377, 1981, pp 98-110, 24 Ref.

"The Human Collision", International Symposium on Occupant Restraint, June 1-3, 1981, Toronto, Ontario, Canada.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: American Association for Automotive Medicine, P.O. Box 222, Morton Grove, Illinois, 60053

348766

DEVELOPMENT AND EFFECTS OF SEAT BELT LAWS IN AUSTRALIA

The events leading to the introduction of the law for the compulsory wearing of seat belts in the State of Victoria are described. There was much opposition to the proposal for compulsory wearing and the story of how this was overcome forms the major part of the paper. The life saving virtues of seat belts had been well known and date back to the year 1903. The advantages of their use in cars had been shown by the work of Bohlin. Prior to the Victorian seat belt law, the advantages to be gained from legislation for compulsory wearing had been proven by a law introduced in Victoria in 1961, which compelled all motor cyclists to wear a crash helmet. This law produced a fifty per cent reduction in deaths and injuries to motor cyclists. When the Snowy Mountains hydro-electric scheme was under construction, the authority insisted on compulsory wearing of seat belts for all of its employees. Despite some very serious accidents, there was not one death or serious injury from an accident during a six year construction period, 1961-67. Subsequent to the introduction of the seat belt law in Victoria, there has been a world wide swing to compulsory legislation because it produces a remarkable saving in lives and reduction in injuries. In Victoria this saving is shown to be about 45% respectively on expected trends.

Joubert, PN (Melbourne University, Australia)
American Association for Automotive Medicine Proceeding HS-032 378, 1981, pp 111-118, 5 Fig., 10 Ref.

"The Human Collision", International Symposium on Occupant Restraint, June 1-3, 1981, Toronto, Ontario, Canada.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: American Association for Automotive Medicine, P.O. Box 222, Morton Grove, Illinois, 60053

348767

HISTORY AND EVALUATION OF SEAT BELT LEGISLATION IN ONTARIO

The Province of Ontario has had mandatory seat belt use legislation in effect since January 1, 1976. Since this was the first seat belt legislation in a major North American jurisdiction, it has been rather extensively evaluated. The present paper reviews the chronology and evaluation of seat belt legislation and various educational efforts bearing on the seat belt issue.

Lonero, LP Pierce, JA (Ontario Ministry of Transportation & Communic, Can)
American Association for Automotive Medicine Proceeding HS-032 379, 1981, pp 119-131, 3 Fig., 26 Ref.

"The Human Collision", International Symposium on Occupant Restraint, June 1-3, 1981, Toronto, Ontario, Canada.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: American Association for Automotive Medicine, P.O. Box 222, Morton Grove, Illinois, 60053

348768

TRANSPORT CANADA'S POLICY ON OCCUPANT RESTRAINTS

The basic principles underlying Transport Canada's policy on occupant restraints are stated and their implications discussed. The functions of the occupant restraint system are reviewed and the performance of these functions by three types of automatic restraint is then compared with that of the conventional 3-point seat belt system. Several respects in which the automatic restraints are expected to be less effective than the 3-point belt are identified. However, it is concluded that continued installation of automatic restraint systems meeting prescribed standards is justified pending the development of more effective means of regulating the performance of occupant restraint systems in general.

Campbell, GD Welbourne, ER (Department of Transport, Canada)
American Association for Automotive Medicine Proceeding HS-032 380, 1981, pp 135-149, 2 Fig., 2 Tab., 12 Ref.

"The Human Collision," International Symposium on Occupant Restraint, June 1-3, 1981, Toronto, Ontario, Canada.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
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348769

AUTOMATIC RESTRAINTS--A TEN YEAR LEARNING CURVE

A great deal of information on automatic restraints has been developed in the past 10 years. This paper reviews General Motors' technical and sales experience with inflatable restraints and automatic belts. Additional accident injury statistics relating to unrestrained adults and children are provided because they are germane to the design of inflatable restraints and to an assessment of the benefits that might be realized by various restraints. Advances in injury assessment technology that can be used toward improving future restraint systems also are reviewed.

Martin, DE (General Motors Technical Center)
American Association for Automotive Medicine Proceeding HS-032 381, 1981, pp 151-164, 3 Fig., 3 Tab., 25 Ref.

"The Human Collision", International Symposium on Occupant Restraint, June 1-3, 1981, Toronto, Ontario, Canada.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
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348770

AUTOMATIC VS MANUAL SAFETY BELT SYSTEMS: A COMPARISON USING STATE ACCIDENT DATA INVOLVING 1975-1979 MODEL VW RABBITS

The primary objective of this research is to assess the (AK)-injury reducing potential of the VW Rabbit automatic shoulder belt/knee bolster system using data consisting of 10,336 accidents involving VW Rabbits during the period 1975-1979 in New York, North Carolina, Maryland, Colorado, Alabama, and South Carolina. The analysis generally involved the following: (1) investigation of potential biases arising from missing belt usage cases; (2) identifying confounding variables by variable screening and then smoothing the data using weighted least squares procedures for categorical data; and (3) examination of the components of the overall (AK)-injury rate reduction, namely components due to usage rate differences, belt system differences, and sample variation. For the primary analyses (NY, NC, MD, and CO), the range of usage rates was 16.6% to 41.6% for manual belts versus 43.1% to 73.7% for automatic belts. Occupants in automatic belt Rabbits experienced 20 to 30 percent fewer (AK)-injuries than their counterparts in Rabbits with conventional 3-point belt systems. The overriding factor for this reduction was the increase (at least two-fold) in the belt usage rates in automatic belt Rabbits. When used, the two belt systems are equally effective in preventing serious injuries. Although there is some variability in the results across states due to differences in reporting thresholds, variable differences, missing data rates, police reporting errors, etc., the reasonable consistency of the results between states suggests a reasonable adequacy of state accident data in addressing a question such as posed herein. In point of fact, alternative data is not yet available.

Reinfurt, DW Chi, GYH (North Carolina University)
American Association for Automotive Medicine Proceeding HS-032 382, 1981, pp 165-174, 1 Fig., 5 Tab., 4 Ref.

"The Human Collision," International Symposium on Occupant Restraint, June 1-3, 1981, Toronto, Ontario, Canada.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
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348771

THE PUBLIC HEALTH IMPLICATIONS OF AUTOMATIC PROTECTION

John Snow did not make history by saying "Don't drink the water." Rather, he altered a water distribution system so that people would not be exposed to cholera. Consideration of basic and successful public health approaches leads to the conclusion that the most effective strategies for reducing human disease and injury are those that adapt the man-made environment so that it will automatically protect society rather than threaten it.

Baker, SP (Johns Hopkins School of Public Health)
American Association for Automotive Medicine Proceeding HS-032 383, 1981, pp 175-179, 14 Ref.

"The Human Collision", International Symposium on Occupant Restraint, June 1-3, 1981, Toronto, Ontario, Canada.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
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348772

DEVELOPMENTS IN INFANT AND CHILD OCCUPANT RESTRAINT SYSTEMS IN THE UNITED STATES

The history of child restraint design, regulation, and use problems in the United States is outlined, and the major features of the new child restraint standard are reviewed. Two aspects of the standard, the buckle-release minimum force requirement and the fixed or movable surface requirement, are highlighted and discussed as potential sources of use and injury problems. Efforts are recommended to reconcile market forces with good restraint design principles and to develop performance standards that encourage the best possible child restraint system designs.

Melvin, JW (Highway Safety Research Institute)
American Association for Automotive Medicine Proceeding HS-032 384, 1981, pp 183-188, 6 Ref.
"The Human Collision," International Symposium on Occupant Restraint, June 1-3, 1981, Toronto, Ontario, Canada.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
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348773

CHILD PASSENGER PROTECTION: THE TENNESSEE ENFORCEMENT STRATEGY

Tennessee, in 1978, became the first state to enact child passenger safety legislation. Law enforcement participation in the program was minimal until the fall of 1979 when the Tennessee Highway Patrol undertook a unique approach to enforcement of the legislation. The Patrol's enforcement strategy has resulted in active enforcement and support for the law among police personnel and strengthened and broadened its public acceptance.

Roberts, G (Tennessee Department of Safety)
American Association for Automotive Medicine Proceeding HS-032 385, 1981, pp 189-200, 2 Ref.
"The Human Collision," International Symposium on Occupant Restraint, June 1-3, 1981, Toronto, Ontario, Canada.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
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348774

SASKATCHEWAN KIDS GET BELTED

The Province of Saskatchewan was the first jurisdiction in Canada and the third in North America to introduce mandatory child restraint use regulations. The law applies to all children born after June 30, 1980 and requires them to be protected by a restraint system appropriate to their weight provided that a seating position fitted with a seat belt is available in the vehicle. The legislation was preceeded by the preparation and distribution of promotional and instructional material for use by public health nurses throughout the province. Enforcement strategies were developed and discussed with police to ensure that they understood and supported the intent of the regulations and that they would be sensitive to the problems and limitations which parents would encounter in attempting to comply with regulations. Although too little time has passed to properly assess the impact of the regulations, public reaction has been very positive with most criticism coming from persons who are unaware of the special exemptions in the regulations or who feel that the the regulations should be more restrictive.

Shiels, AC (Highway Traffic Board)
American Association for Automotive Medicine Proceeding HS-032 386, 1981, pp 201-208, 1 Ref., 1 App.
"The Human Collision," International Symposium on Occupant Restraint, June 1-3, 1981, Toronto, Ontario, Canada.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
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348775

THE PEDIATRICIAN AND AUTOMOBILE PASSENGER TRAUMA PREVENTION

This paper presents the role of the pediatrician and the commitment of the American Academy of Pediatrics to child automobile passenger safety. A brief summary of the nature and scope of the highway epidemic is given. The historical role of pediatricians in addressing the problem is reviewed. A new, innovative project of the Academy of Pediatrics, "The First Ride... A Safe Ride," as part of an overall child passenger safety program is presented. The goals, objectives and the organizational structure of this major emphasis project, and the commitment of the Academy to achieve this is outlined. We emphasize the fact that the prevention of highway trauma is a medical problem. It requires a serious commitment, working together, of pediatricians, other health care specialists, and their organizations to influence public, education and research to further the proper use of child passenger restraining devices.

Holroyd, HJ (American Academy of Pediatrics)
American Association for Automotive Medicine Proceeding HS-032 387, 1981, pp 209-216, 1 Tab., 5 Ref.
"The Human Collision," International Symposium on Occupant Restraint, June 1-3, 1981, Toronto, Ontario, Canada.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: American Association for Automotive Medicine, P.O. Box 222, Morton Grove, Illinois, 60053

348776

PROTECTION FOR THE SEVERELY DISABLED--A NEW CHALLENGE IN OCCUPANT RESTRAINT

The numbers of severely disabled persons using public and private motor vehicle transportation to gain greater mobility and independence in their daily lives has risen substantially in recent years and is likely to continue to increase in the years ahead. While a significant effort has gone into finding new ways to make motor vehicle transportation accessible to these persons, relatively little concern appears to have been given to the safety of these passengers and drivers. Sled impact tests of typical wheelchair securement systems and occupant restraints for persons in wheelchairs reveal that most persons who must use their wheelchair for a vehicle seat are at high risk of injury in a vehicle accident. While the problem of occupant protection for this population is more complex than for the able-bodied, significant improvements in this situation could be made with good engineering design that adheres to basic crashworthiness principles and takes into account the magnitudes of forces generated in the crash environment.

Schneider, LW (Highway Safety Research Institute)
American Association for Automotive Medicine Proceeding HS-032 388, 1981, pp 217-231, 9 Fig., 1 Tab., 11 Ref.
"The Human Collision", International Symposium on Occupant Restraint, June 1-3, 1981, Toronto, Ontario, Canada.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
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348777

THE SYSTEMS APPROACH

The design and development of motor vehicle occupant protection utilizing a systems approach appears feasible. The use of a knee bar and the seat cushion for principal energy input, of an extended dashboard for restraint of the upper thigh, of the dashboard for impact protection of the chest and shoulders, and of a widened, more sloping windshield for head impacts and restraint are within present engineering and design capabilities. In higher energy collisions, the systems approach allows the collision forces to be dissipated over more of the body surface and in less vulnerable anatomic areas, such as the knees and buttocks. Especially in jurisdictions where seat belt usage is low, these energy absorbing systems will aid immeasurably in dissipating collision forces, although they may not provide the stabilizing effect of a belt restraint. To efficiently design such a system, however, additional knowledge of the kinematics and injury tolerances of the human body are essential.

States, JD (Rochester University)
American Association for Automotive Medicine Proceeding HS-032 389, 1981, pp 235-243, 4 Fig., 19 Ref.
"The Human Collision," International Symposium on Occupant Restraint, June 1-3, 1981, Toronto, Ontario, Canada.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
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348778

OCCUPANT RESTRAINTS: AN ISSUE FOR THE 80'S

In the decade of the 80's, the author foresees more countries requiring the use of restraint systems because public awareness has awakened the concern of legislators. Data are also beginning to become available on the societal cost of long-term hospitalization and care, with a tremendous amount of dollars being spent to maintain individuals injured in motor vehicle accidents. There is a need for improved systems to be developed to collect data on the mechanisms of injuries from real-world crashes, monitoring the effectiveness of various types of restraint systems, and for further laboratory studies on the biomechanical aspects of injuries, thereby providing data to car designers to develop additional occupant protection features. The medical community needs not only to be educated as to the benefits of restraint systems, but to set an example by using them and telling others to buckle up.

Huelke, DF (Highway Safety Research Institute)
American Association for Automotive Medicine Proceeding HS-032 390, 1981, pp 245-248

"The Human Collision," International Symposium on Occupant Restraint, June 1-3, 1981, Toronto, Ontario, Canada.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: American Association for Automotive Medicine, P.O. Box 222, Morton Grove, Illinois, 60053

348779

SALUS POPULI SUPREMIS LEX: A MEDICAL PERSPECTIVE

The public good is the greater law is one of the fundamentals of our judicial system in North America. This, when applied to mandatory restraint use legislation should be invoked only if the laws of common sense and self preservation have been ignored by an informed motoring public. This infringement of an individual's rights can be justified by statistics that support the ameliorating effect of restraint systems upon the injuries sustained by restrained automobile passengers. The development of an integrated crash protection package of greater sophistication and effectiveness must receive top priority in the actions of the automotive industry both in North America and abroad.

Ghent, WR (Queen's University, Canada)
American Association for Automotive Medicine Proceeding HS-032 391, 1981, pp 249-252

"The Human Collision," International Symposium on Occupant Restraint, June 1-3, 1981, Toronto, Ontario, Canada.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: American Association for Automotive Medicine, P.O. Box 222, Morton Grove, Illinois, 60053

348841

ROUNDABOUTS: A REVIEW OF ACCIDENT PATTERNS

The number of roundabout type intersection treatments in Victoria has increased from less than 200 in 1978 to over 400 in 1980 and this form of control has received a wide acceptance from all sections of the community. The installation of a roundabout can achieve substantial improvements in terms of intersection performance particularly in the area of vehicle to vehicle accidents. This paper reviews the accident patterns of a sample of roundabouts and compares the after experience with the before situation. An assessment is also made of the operational characteristics and design standards used at each roundabout to determine the effect of alternative layouts and beautification treatments. The study shows that roundabouts are an effective method of reducing the incidence and severity of right angle accidents at intersections, however proper consideration at the design stage is necessary in order that single vehicle accident type incidents are not increased. It is also concluded that the time distribution of accidents at roundabouts is significant as a high proportion of reported accidents occur during the hours of darkness. A review is also provided of existing design guidelines for roundabouts (A). (TRRL)

Daley, KF (Victoria Road Safety & Traffic Authority,Australia)
Institution of Engineers, Australia No. 81/7, 1981, pp 31-35, 6 Fig., 4 Tab.

First National Local Government Engineering Conference 1981, Adelaide.

ACKNOWLEDGMENT TRRL (IRRD 255013), Australian Road Research Board

348861

A METHOD FOR DETERMINING THE ACCIDENT POTENTIAL OF AN INTERSECTION

The paper describes an investigation into the feasibility of predicting the accident potential of an intersection by the application of a model, based on accident occurrences at individual conflict points, within a signal controlled four-legged intersection with two-way flow on each leg. The model developed involved the stratification of intersection movements into individual turning movements resulting in nine conflict types, giving rise to 24 conflicting flows and 36 conflict points. The stability of the accident rate for each conflict type is investigated, and a relationship derived which was sensitive to changes in traffic volumes. Comparisons were made between actual and predicted annual numbers of accidents at 30 junctions of the type described in Pretoria and Johannesburg. The average difference was found to be 16 per cent for an annual total of 468 accidents. Results also indicate that the accident rates derived for the nine different types of conflict could be used to predict accidents at similar types of intersection with similar flow patterns. (TRRL)

Brown, RJ (Witwatersrand University) *Traffic Engineering and Control* Vol. 22 No. 12, Dec. 1981, pp 648-651, 3 Fig., 5 Tab., 10 Ref.

ACKNOWLEDGMENT TRRL (IRRD 259327)

348914

AGE, DRIVING EXPERIENCE, AND ENGINE CAPACITY AND THEIR EFFECTS ON MOTORCYCLE ACCIDENTS

This paper considers the effect of age, length of time a motorcycle licence has been held and engine capacity on an exposure-adjusted accident rate. It was found that the engine capacity of the motorcycle has no significant effect on the motorcycle accident rate but that the age and driving experience of riders do have a statistically significant effect on the accident rate. It is concluded that further legislation on engine capacity restrictions is not warranted by this study's findings but that restrictions on low experience and age groups in the form of an "apprenticeship" involving restrictions as to hours in which motorcycles may be used may well produce a reduction in the accident rate. (Author)

Hull, M *Traffic Research Circular* No. 17, Oct. 1981, 17p, Figs., Tabs., Apps.

348915

THE TRANSPORTATION OF HAZARDOUS MATERIALS

The increasing use of dangerous chemicals and petroleum products by S.A. industry makes it necessary for some form of control to be introduced to regulate the transport of these materials before a major disaster occurs, such as has occurred overseas. This report examines all the aspects that could increase the likelihood of such a disaster occurring, including the preparedness of emergency services. It also recommends the improvements or changes required to minimize this possibility. It is apparent that the training and ability of vehicle drivers are key areas in this respect and they are discussed at length. Forthcoming regulations under the Hazardous Substances Act No. 15 of 1973 are examined and the effects of over-restrictive legislation considered. The report concludes that legislation promulgated gradually to reinforce voluntary industrial practices will ultimately restrict this type of transport to the safety-conscious and competent operator, therefore minimizing the risk as much as possible. (Author)

Hillman, JC
National Institute for Transport & Rd Res, S Af Tech Rpt RV/1/81, Apr. 1981, 43p, Figs., Tabs., Refs., Apps.

348918

THE RELATIONSHIP BETWEEN RURAL SPEED LIMIT AND ACCIDENT RATE

A relationship between accident rate and rural speed limit has been derived for freeways and bitumenized non-freeway roads, using data from a number of countries. The relationship is linear over the speed limit range of 70 km/h to 130 km/h. The formulae will be incorporated in the RODES2 computer program, which calculates the operational costs (including accident costs) of a given road alignment. If we apply the results to 1980 South African accidents, we can tentatively estimate that if the current 90 km/h speed limit were raised to 120 km/h on freeways and 100 km/h on other roads, the rural accidents would increase by 3,000, at an additional accident cost of R32 million. (Author)

Fieldwick, R
National Institute for Transport & Rd Res, S Af Tech. Rpt. RF/1/81, Jan. 1981, 21p, Figs., Tabs., Refs., Apps.

348933

A SURVEY OF RESEARCH INTO RELATIONSHIPS BETWEEN TRAFFIC ACCIDENTS AND TRAFFIC VOLUMES

Previous research into relationships between road accident frequencies and traffic volumes is reviewed. Methods used are assessed and the main conclusions of the soundest studies drawn together. Some researchers have deduced theoretical relationships between accident numbers and traffic volumes and checked these against data, while others have derived relationships more empirically. In order to deduce an empirical relationship, it is necessary either to study different roads carrying different volumes of traffic, or to examine time-series data. Research of the former type has often shown that the number of single-vehicle accidents per unit of vehicle distance travelled tends to decrease with increasing traffic, while the number of collisions between two or more vehicles tends to increase. Knowledge about relationships between accidents and traffic volumes at intersections is less extensive but includes useful results. Time-series studies have usually shown that accident numbers have grown more slowly in the long term than have volumes of traffic, but, because of the many other time-dependent factors which affect the incidence of accidents, care must be taken in drawing conclusions from such studies about the underlying relationship between accidents and traffic volumes. Comments are made concerning the data and methods likely to be useful in further research. (Author/TRRL)

Satterthwaite, SP (University College, London)
Transport and Road Research Laboratory, (0305-1315) Monograph SR 692, 1981, 41p, 4 Fig., 87 Ref.

Acknowledgment: TRRL (IRRD 259020)

348943

ROAD SAFETY: A REVIEW OF RESEARCH AND PRACTICE. SECTION 1. ROAD SAFETY: PAST, PRESENT AND FUTURE. SECTION 2. METHODS AND ANALYSES. SECTION 3. ROAD USER EDUCATION AND ATTITUDES

The first 3 sections of the book contain the following papers: Highway Safety: Past and Future (Cantilli, EJ); The Organization of Road Safety in Great Britain (Dean, C); The Usefulness of Hospital In-Patient Data for Road Safety Studies (Nicholl, JP); Driver Gap Acceptance as a Measure of Accident Risk (McDowell, MRC, Darzentas, J and Wennell, J); Traffic Conflicts: A Measure of Road Safety (Zimolong, B); Methods of Measuring Driving Performance under the Influence of Alcohol, Drugs and Fatigue (Willumeit, H-P, Kramer, U and Neubert, W); Engineering Programmes for Accident Reduction (Huddart, KW and Dean, JD); Pedestrian Injuries: The Influence of Vehicle Design (Ashton, SJ); Designing Road Safety Teaching and Publicity Materials for Children (Sheppard, D); Traffic Education for Young Children (Rothengatter, T); Child Cycling Behaviour and the Effects of Safety Instruction (Risk, A); Improving Parental Road Safety Practice and Education with Respect to Preschool Children (Downing, CS); Handicapped People in Traffic (Boecher, W and Geiler, M); Discrimination against Majority Groups: The Elderly and the Handicapped (Van Der Does, VI); Driver Improvement: An Approach to Road Safety (Kroj, G); (continued on TRIS 348944). (TRRL)

Foot, HC, Editor Chapman, AJ, Editor Wade, FM, Editor Cantilli, EJ Dean, C Nicholl, JP McDowell, MRC Darzentas, J Wennell, J Zimolong, B Willumeit, H-P Kramer, U Neubert, W Huddart, KW Dean, JD Ashton, SJ Sheppard, D Rothengatter, T Risk, A Downing, CS Boecher, W Geiler, M Vanler, T Kroj, G
Praeger Publishers Monograph 1981, 242p, Figs., Tabs., Refs.

Acknowledgment: TRRL (IRRD 258855)

348944

ROAD SAFETY: A REVIEW OF RESEARCH AND PRACTICE. SECTION 4. PEDESTRIAN BEHAVIOUR. SECTION 5. DRIVER BEHAVIOUR (CONTD)

(continued from TRIS 348943). A strategic approach to child pedestrian safety (Howarth, CI and Lightburn, A); Child pedestrian behaviour (Chapman, AJ, Sheehy, NP, Foot, HC and Wade, FM); Elderly pedestrians and road safety (Wilson, JR and Rennie, AM); Traffic signs for pedestrians (Nel, PW); On the perceptual separation of pedestrians and motorists (Rapoport, A); The effects of ageing on driver abilities, accident experience and licensing (Planek, TW); Personal perceptions of fatigue (Nelson, TM); Alcohol, other drugs and driving (Simpson, HM and Warren, RA); Effects of long-duration car driving on stress cognition (Hoyos, CG, Galsterer, H and Stotz, E); Undesirable driving practices in Great Britain (Wilson, T); Risk of accident involvement for motorcyclists (Bragg, BWE); A behavioural theory of driving and accident causation (Risk, A). (TRRL)

Foot, HC, Editor Chapman, AJ, Editor Wade, FM, Editor Howarth, CI Lightburn, A Sheehy, NP Wilson, JR Rennie, AM Nel, PW Rapoport, A Planek, TW Nelson, TM Simpson, HM Warren, RA Hoyos, CG Galsterer, H Stotz, E Wilson, T Bragg, BWE Risk, A
Praeger Publishers Monograph 1981, 242p, Figs., Tabs., Refs.

Acknowledgment: TRRL (IRRD 258856)

348957

APPLICATION OF LOW-COST ROAD ACCIDENT COUNTERMEASURES ACCORDING TO AN AREA-WIDE STRATEGY

The project described used a 2.8 km section of the a345 all purpose arterial road running radially from the edge of swindon central area to the urban boundary to show how road safety and traffic efficiency could be improved using the strategy. Previous statistics showed that the majority of accidents on the route were associated with a right-turn manoeuvre at one of the many intersections on the road. The effectiveness of a package of safety measures introduced along the study route was monitored in parallel with control sections of similar routes and possible alternative routes. Although the control procedure failed because of fundamental differences in the chosen routes and the study route, there was a genuine 10 per cent reduction in accidents along the study route associated with a reduction in delays to other traffic caused by vehicles waiting to turn right. Travel time, fuel consumption and intersection capacity have also improved. There appeared to be no adverse effect on the accessibility to residential premises lying behind the study route. It was estimated that the first-year rate of return of the cost was about 55 per cent. (TRRL)

Dalby, E (Transport and Road Research Laboratory) Ward, H (University College, London) *Traffic Engineering and Control* Vol. 22 No. 11, HS-032 787, Nov. 1981, pp 567-575, 4 Fig., 4 Tab., 7 Ref.

Acknowledgment: TRRL (IRRD 258890)
Order From: Printerhall Limited, 29 Newman Street, London, England

349032

ANALYSIS OF DRIVE TRAIN NOISE AND VIBRATION

One of the important themes in this age of conservation of resources and energy is the reduction of vehicle weight, which helps to improve running performance, but which generally produces undesirable effects in terms of noise and vibration. To reduce noise and vibration inside a car and reduce its weight at the same time, it is now necessary to re-examine the conventional method of reducing noise and vibration, and deal with the problem by using a more advanced method. What is important with regard to noise and vibration inside the car is the noise and vibration of the drive train, and many useful studies on the drive train have been reported in Japan. Drive train vibration can roughly be classified into bending vibration and torsional vibration. Generally, they are combined, and may have nonlinear characteristics. All this makes the problem quite complex. This report introduces a selection of previously announced, important study results which have been edited to enable the reader to understand the outline of the Japanese studies on drive train. The report covers the following: drive train vibration analysis (linear and nonlinear vibrations); engine surge and drive train vibration; and differential gear noise and drive train vibration.(a) (TRRL)

Chikamori, S Yoshikawa, N (Mitsubishi Motors, Japan) *International Journal of Vehicle Design* Vol. 2 No. 4, HS-032 732, Nov. 1981, pp 408-427, 26 Fig., 13 Ref.

Acknowledgment: TRRL (IRRD 258944)
Order From: Inderscience Enterprises Limited, La Motte Chambers, St Helier, Jersey, England

349034

AUTOMATIC HYDROMECHANICAL TRANSMISSIONS OF MOTOR VEHICLES IN THE USSR

Current designs of Soviet hydromechanical transmissions (HMTs) for buses, trucks and passenger cars are briefly described. Not all the HMTs feature automatic gear changes, but every one of them incorporates a torque converter and uses friction elements-and, in some cases, one-way clutches-to effect the gear changes. The HMTs of buses incorporate two-, or three-speed nonplanetary gear trains. Three-and five-speed nonplanetary gear trains are used in the HMTs of BelAZ quarry dumptrucks and three-and four-speed planetary gear trains are used in the HMTs of heavy-duty MAZ all-terrain wheeled tractors. The HMTs of the passenger cars ZIL and GAZ have three-speed planetary gear trains. Two HMTs with three-speed gear trains for passenger cars with engine displacements of 1.2-2.0l have been designed: a planetary type-made in cooperation with Czechoslovakia, and a nonplanetary type-made by the Izhevsk car plant. Both are studied for significant increase in efficiency. (TRRL)

Narbut, AN (Moscow Auto and Road Construction Institute) *International Journal of Vehicle Design* Vol. 2 No. 4, HS-032 733, Nov. 1981, pp 453-462, 8 Fig., 1 Tab., 11 Ref.

Acknowledgment: TRRL (IRRD 258947)
Order From: Inderscience Enterprises Limited, La Motte Chambers, St Helier, Jersey, England

349035

AN EXPERIMENTAL INVESTIGATION INTO VEHICLE RESPONSE DURING STEERING AND BRAKING MANOEUVRES

A study is presented of the response of a road vehicle to steering and braking manoeuvres conducted under conditions of differing tyre-inflation pressures. It is shown that the directional response of the vehicle to a given steering input is closely dependent on the front tyre-inflation pressure; rear tyre-inflation pressure, however, is shown to have no significant effect on vehicle motion. The variation of vehicle lateral acceleration produced by a fixed angle of steering input, at different vehicle speeds, with underinflated and overinflated front tyres is demonstrated. It is also shown that, during combined steering and braking, the front tyre-inflation pressures play an important role in changing the front-wheel locking sequence thus changing the vehicle's directional stability.(a) (TRRL)

El-Gindy, M Llosvai, L (Technical University, Budapest) *International Journal of Vehicle Design* Vol. 2 No 4, HS-032 741, Nov. 1981, pp 463-469, 7 Fig., 8 Ref.

Acknowledgment: TRRL (IRRD 258948)
Order From: Inderscience Enterprises Limited, La Motte Chambers, St Helier, Jersey, England

349036

MOTOR CAR LATERAL IMPACTS AND OCCUPANT INJURIES

Data obtained from in-depth and mass surveys is examined to provide an insight into the characteristics of lateral car impacts in general, and lateral car-to-pole impacts in particular. It is shown that the rate of fatalities per crash is seven times higher in lateral pole impacts than for collisions overall. The probability of injury and fatality is compared for occupants seated on the near side of the impact to those seated on the far side, for a number of different types of lateral impacts. Poles and trees cause the greatest hazard to the far side occupant than any other bullet object that could be differentiated. For the in-depth cases examined, it appeared that only the occupant whose head or torso was centred on pole or tree intrusion died. For these victims as well as for those centred on the intrusion caused by another car in such collisions, the severity of the injury correlated significantly with the magnitude of the intrusion. For all other seated locations no such correlation could be found. In three quarters of the fatalities caused by car-to-pole collision, the fatal injury was only to the head, but in the forty times more numerous car-to-car side impact, three quarters of the deceased had among other fatal injuries, fatal injuries to the thorax and abdomen. Consequently, an extensive protection mechanism has to be devised for side impacts in general. From theoretical studies, it is argued that the occupant centred on the intrusion suffers the most rapid change in velocity and probably strikes the hardest targets. On balance, there is an argument for the reinforcement and improved padding of the side structure of motor cars to reduce the overall risk to which currently car occupants are exposed.(a) (TRRL)

Lozzi, A (Sydney University, Australia) *International Journal of Vehicle Design* Vol. 2 No. 4, HS-032 736, Nov. 1981, pp 470-479, 2 Fig., 3 Tab., 17 Ref.

Acknowledgment: TRRL (IRRD 258949)
Order From: Inderscience Enterprises Limited, La Motte Chambers, St Helier, Jersey, England

349037

SOCIAL AND ENVIRONMENTAL IMPACTS OF ELECTRIC AND HYBRID VEHICLES

The social and environmental impacts of electric and hybrid vehicles include effects on mobility and travel, electricity supply system operation, petroleum and other fuel consumption, air pollution and traffic noise. An estimated 80 per cent of average annual vehicle kilometres can be electrified. Electricity supply systems will not need to expand capacity, and will benefit from load levelling if overnight recharging of electric vehicles is encouraged. Petroleum consumption for transportation purposes will decline, but the benefits are dependent on the type of fuel used to generate recharge electricity. The fuel mix used by power stations also determines air pollution impacts, since decreases in vehicle emissions are accompanied by increases in power plant emissions. Improvements in traffic noise are modest, with 100 per cent electrification of light vehicles producing a 13 per cent decrease in traffic noise impacts.(a) (TRRL)

Hamilton, WF Morecraft, LM Carriere, WM (General Research Corporation) *International Journal of Vehicle Design* Vol. 2 No. 4, HS-032 739, Nov. 1981, pp 480-496, 9 Fig., 2 Tab., 5 Ref.

Acknowledgment: TRRL (IRRD 258950)
Order From: Inderscience Enterprises Limited, La Motte Chambers, St Helier, Jersey, England

349038

VEHICLE DEFORMATION PATTERNS IN NEW ZEALAND ROAD ACCIDENTS

This paper presents partial results of a study undertaken by the University of Auckland in cooperation with the Ministry of Transport in New Zealand, into vehicle damage characteristics in typical road accidents. The overall objective of the study was to evaluate the likely effect of vehicle damage on child restraint systems installed in vehicles in common use on New Zealand roads. The results presented here, relate specifically to vehicle deformation and encroachment as recorded at the accident scenes by traffic officers over a 3 month period. It would appear from the results of the study involving 406 vehicles, that the likelihood of encroachment into the passenger compartment as a result of an accident, is considerably less for the centre back seat position. This confirms the widely accepted view that it represents the most desirable location for a child safety restraint system with regard to possible injury caused by vehicle deformation.(a) (TRRL)

Tedford, JD Milne, L (Auckland University, New Zealand) *Accident Analysis and Prevention* Vol. 13 No. 4, HS-032 728, Dec. 1981, pp 279-287, 8 Fig., 4 Tab., 9 Ref.

Acknowledgment: TRRL (IRRD 258980)
Order From: Pergamon Press Limited, Headington Hill Hall, Oxford OX3 0BW, England

349039

STATISTICAL ANALYSES OF HIGHWAY COMMERCIAL VEHICLE ACCIDENTS

In a research program aimed at the assessment of more comprehensive accident analysis methods, new applications of statistical analysis procedures to commercial vehicle accidents have been investigated, and exemplary results obtained (Philipson et al, 1978). A file of some 3000 specially-detailed California Highway Patrol accident reports from two areas of California during a period of about one year in 1975-76 provided the unique data base for the application. Computer implementation and evaluation through statistical testing of the quality of the data file were first accomplished. Then an exhaustive univariate analysis of the data was conducted to describe the file in detail. Selected sets of dependent and independent variables were then subjected to analyses of association employing contingency table analysis methods. In several cases, acceptable log-linear models to explain the variables' association were thereby established. Vehicle exposure measured in vehicle miles travelled for each vehicle category was introduced into one of the analyses to assess its impact on the set of significant interactions; it was indeed found to be important, albeit accuracy in its estimation was problematical. This estimation was carried out by two independent methods; a "direct" procedure based on a series of linear extrapolations of basic state of California commercial vehicle traffic data, and an "induced" estimation procedure essentially employing only data in the accident reports. The results of the two methods exhibited some common trends, but otherwise differed considerably. The results of the research effort, highlighted in this article, indicated the value of the methods investigated, and so of the detailed accident report files necessary for their use. They also strongly illuminated the areas of greatest difficulty in the application of these methods, basically associated with accident data quality and exposure estimation accuracy, and general directions for their improvement.(a) (TRRL)

Philipson, LL (Wiggins (JH) Company) Rashti, P Fleischer, GA (University of Southern California) *Accident Analysis and Prevention* Vol. 13 No. 4, HS-032 722, Dec. 1981, pp 289-306, 1 Fig., 11 Tab., 13 Ref.

ACKNOWLEDGMENT TRRL (IRRD 258981)
ORDER FROM Pergamon Press Limited, Headington Hill Hall, Oxford OX3 0BW, England

349110
METHODS FOR EVALUATING ROAD SAFETY MEASURES
The Road Research Group on "Methods for Evaluating Road Safety Measures" was established to review the most appropriate techniques for the assessment of the effectiveness of safety measures and the determination of their relative priorities. The study, in which experts from 15 countries participated, examines the issue of identifying traffic safety measures in the present context of policy and decision-making in this field, and sets forth the various criteria for assessing their impacts. The major part of this study is devoted to methods of determining effectiveness of countermeasures as well as techniques of evaluation and priority setting. The group also attempted to review current use of evaluation procedures in member countries, presenting a number of examples of evaluations recently carried out. The report ends with a list of conclusions and recommendations for those responsible for decision-making in the field of traffic safety and the implementation of accident countermeasures as well as a compilation of further research needs. (Author/TRRL)

Organization for Economic Cooperation and Devel Monograph 1981, 108p, Figs., Tabs., Refs.

ACKNOWLEDGMENT TRRL (IRRD 257459)

349137
THE PEDESTRIAN PROBLEM: A 12-MONTH REVIEW OF PEDESTRIAN ACCIDENTS
Three hundred and sixty-one pedestrians involved in road accidents in the course of a year have been studied. Fourteen of the pedestrians died following hospital admission, and analysis of data from Strathclyde police showed that another 16 pedestrians died at the roadside. Certain characteristics of the whole group are reviewed and a plea is made for more appropriate use of available statistics in the production of practical road safety legislation. (Author/TRRL)

Galloway, DJ Patel, AR (Western Infirmary, Glasgow) *Injury* Vol. 13 No. 4, Jan. 1982, pp 294-298, 4 Tab., 9 Ref.

ACKNOWLEDGMENT TRRL (IRRD 259323)

349152
THE EFFECT OF A MECHANICAL SURVEILLANCE DEVICE ON URBAN SIGNALISED INTERSECTION ACCIDENTS
The effect of a mechanical surveillance device on urban signalised intersection accidents was evaluated. The mechanical surveillance device used in the study was a traffic violation photorecorder which automatically photographed red traffic light violators 24 hours a day. The evaluation design used a before and after comparison of the experimental location with nine control locations. The effect of the photorecorder on the number of collisions between vehicles travelling at right angles or from opposite directions with one vehicle turning right (indirect right angle) was investigated. During the first year of photorecorder operation there was a 55.6 per cent net reduction in right angle and indirect right angle accidents at the intersection monitored by the photorecorder compared with the previous year. This reduction in the number of right angle and indirect right angle accidents was statistically significant when compared with one year and two year before periods. The introduction of the photorecorder was also accompanied by a net increase in rear end accidents and as a result there was little change in the total number of reported accidents. However, there was a net reduction in casualty accidents and accidents occurring at night. These results were not statistically significant. Analysis of all signalised intersection accidents in western Australia in 1980 showed that both right angle and indirect right angle accident types were significantly more serious than rear end accidents (A).

Maisey, GE *Research and Statistics Report* Monograph No. 17, June 1981, 15p, 1 Fig., 7 Tab., 7 Ref.

ACKNOWLEDGMENT TRRL (IRRD 255061), Australian Road Research Board

349184
HIGHWAY ENGINEERING EXCHANGE PROGRAM
The purpose of the Highway Engineering Exchange Program (HEEP) is to promote the exchange of computer programs, systems and concepts between its members in the field of civil engineering, transportation, and management. Membership is open to those active in highway engineering in Federal, state, provincial, and local government and in institutions of higher education. This edition of HEEP's newsletter contains the minutes of 1981 annual meeting, as well as the minutes of the various regional meetings held in 1981. It also contains an inventory of the hardware and software systems in use in each of a number of Federal, state, provincial and local transportation agencies.

Virginia Department of Highways and Transportation Issue no. 35, Feb. 1982, 206p, Figs., Tabs.

349190
SAFETY RELATED RECALL CAMPAIGNS FOR MOTOR VEHICLES AND MOTOR VEHICLE EQUIPMENT, INCLUDING TIRES JANUARY 1, 1980 TO DECEMBER 31, 1980
This document contains defect recall campaign analysis by manufacturers both domestic and foreign for motor vehicles, motor vehicle equipment and tires, required by Section 151 of the National Traffic and Motor Vehicle Safety Act of 1966 as amended.

National Highway Traffic Safety Administration HS-805 869, 1981, 21p
Reported to the National Highway Traffic Safety Administration by Domestic and Foreign Vehicle Manufacturers.

ACKNOWLEDGMENT National Highway Traffic Safety Administration
ORDER FROM GPO

349191
SAFETY RELATED RECALL CAMPAIGNS FOR MOTOR VEHICLES AND MOTOR VEHICLE EQUIPMENT, INCLUDING TIRES JANUARY 1, 1981 TO MARCH 31, 1981
This document contains defect recall campaign analysis by manufacturers both domestic and foreign for motor vehicles, motor vehicle equipment and tires, required by Section 151 of the National Traffic and Motor Vehicle Safety Act of 1966 as amended.

National Highway Traffic Safety Administration HS-805 879, 1981, 11p
Reported to the National Highway Traffic Safety Administration by Domestic annd Foreign Vehicle Manufacturers.

ACKNOWLEDGMENT National Highway Traffic Safety Administration
ORDER FROM GPO

349192
DRIVER LICENSING LAWS RATED
A rating of state driver licensing laws is presented and compared with the driver licensing provisions of the Uniform Vehicle Code as of January 1980. The basis of the rating is the book "Driver Licensing Laws Annotated" (National Committee on Uniform Traffic Laws and Ordinances, 1980, with annual supplement), which provides a summary of the driver licensing laws of all the states. It contains "Statutory Annotations" which compare state laws with all sections of chapter six of the Uniform Vehicle Code. The rating in this Commentary represents a numerical summary of the information contained in those Annotations. It is designed to facilitate rapid identification of particular areas in state driver licensing law in the United States. It identifies concepts in driver licensing which have been widely adopted by the states, and concepts which have not generally been accepted. It identifies states whose driver licensing laws need substantial attention on a priority basis as part of contemporary efforts to improve highway safety. It allows a state to quickly determine which laws it lacks, and which of its laws differ markedly from the Uniform Vehicle Code and the laws of other states.

English, JW (National Committee on Uniform Traf Laws & Ordinanc) *Traffic Laws Commentary* Vol. 10 No. 2, HS-805 870, Apr. 1981, 30p, 8 Tab., 4 App.

Acknowledgment National Highway Traffic Safety Administration
Order From GPO

349193

DECISION ANALYSIS OF THE "DAYTIME RUNNING LIGHTS" PROJECT

The objective of this study is to reduce daytime motor vehicle accidents by improving vehicular conspicuity with daytime running lights. This report contains the following: (A) Project Plan and Background; (B) Decision Analysis Model; (C) Identification of Countermeasures and Candidate Populations; (D) Accident, Injury and Fatality Counts; (E) Estimated Fatality Reductions; (F) Cost Information and (G) Model Analysis.

National Highway Traffic Safety Administration, (NRM-11) HS-805 962, June 1981, 85p

Acknowledgment National Highway Traffic Safety Administration
Order From National Highway Traffic Safety Administration, 400 7th Street, SW, Washington, D.C., 20590

349194

A DESCRIPTIVE STUDY OF ROLLOVER CRASHES

This report is a descriptive study of rollover crashes prepared in support of 400 series rulemaking. The purpose of the study is to give information about the environment and location of rollover crashes, general vehicle behavior and damage and occupant injuries. The first part of of the report concentrates on accident environment and general accident features. The second part includes vehicle behavior and damage and discusses roof crush, number of quarter turns of roll and similar items. The final part considers occupant injury and ejection in detail.

McGuigan, R Bondy, N
National Highway Traffic Safety Administration, (NRD-31) HS-805 933, July 1980, 45p, Tabs.

Acknowledgment National Highway Traffic Safety Administration
Order From National Highway Traffic Safety Administration, 400 7th Street, SW, Washington, D.C., 20590

349253

TRAFFIC SAFETY IMPACT OF THE EXTENSION OF DRIVER LICENSES BY MAIL FOR RENEWAL APPLICANTS WITH CLEAN PRIOR DRIVING RECORDS

Drivers under the age of 70 whose prior four-year accident and conviction records showed no entries when examined two months prior to the date of the expiration of their driver licenses were randomly assigned to either a group which renewed licenses in the normal manner or a group which was offered the opportunity to receive a four-year license extension by mail (AB 777-Calvo II). A related experiment (AB 583-Calvo I) involved comparing clean-record drivers given a two-year extension with a group required to renew in person. There was no evidence that extending licenses by mail affected accidents or convictions during the period 18 months subsequent to the data on which renewal or extension notices were sent. This was true for the driver group as a whole and for all subgroups with two exceptions. In the four-year extension program, extended drivers under 30 showed a significant conviction increase; however, since this effect was not found in the two-year extension program, there is a substantial likelihood that it was due to chance. Drivers 70 years of age and older were excluded from the four-year extension program; but among two-year extended drivers, those over 70 had significantly fewer accidents than their counterparts in the regular renewal group. Another subgroup of drivers who were offered extensions because their records were clean at the time of selection, but who were later found to have a record entry (because of the lag time between occurrence of an accident or citation and update of the DMV record) also showed no evidence of an effect due to the extension program. The two-year extension evaluation showed similar results. The savings (reducible departmental costs) for FY 1981-82, if the extension program continues to replace the regular renewal process, were estimated to be $2,766,000. Because extensions were for a period of four years, and the present report is based on only 18-month subsequent records, the findings must be considered tentative. Four-year record data will be examined later, as they become available. Multiple extensions should be authorized and evaluated for drivers with continuing clean records. The report concludes that the extension program has been successful and that the present exclusion of drivers 70 and above should be abandoned. (Author)

Janke, MK Kelsey, SL
California State Department of Motor Vehicles CAL-DMV-RSS-81-80, Dec. 1981, 36p, 6 Tabs., Refs., 6 App.

349254

WHEN MOTOR VEHICLES HIT JOGGERS: AN ANALYSIS OF 60 CASES

This study describes the circumstances of 60 jogger-motor vehicle collisions. These incidents happened most often after dark. Young males were involved in a majority of cases. And more often than not, joggers were struck while running on roads in the same direction as vehicles. In a substantial minority of collisions, two or more persons were jogging together. (Author)

Williams, AF (Insurance Institute for Highway Safety) *Public Health Reports* Vol. 96 No. 5, Sept. 1981, 4p, Figs., 3 Tab., 18 Ref.

Acknowledgment National Safety Council, Safety Research Info Serv

349255

OREGON MOTORCYCLE CRASHES: AN ANALYSIS

One function of the present study is to evaluate the extent of helmet use for operators in crashes in the last half of 1979 and to relate usage to factors such as age, sex, accident severity, license status, and insurance compliance. The current study relates helmet use to severity of crashes, especially fatal crashes, to ascertain the impact of helmet law repeal. The effectivenss of seatbelts as a protective device in a passenger car crash sample also will be considered. Another function of this study is to compare, whenever possible, Oregon data with that of the recently published "Motorcycle Accident Factors Study" conducted by the Traffic Safety Center of the University of Southern California (National Traffic Safety Administration 1980). (Author)

Howard, V, Editor
Oregon Department of Transportation DMV-P10-500, Mar. 1981, 23p, 3 Tab.

Acknowledgment National Safety Council, Safety Research Info Serv

349256

THE PEDESTRIAN IN THE TRANSPORTATION SYSTEM: PROPOSED TRAFFIC SAFETY LEGISLATION

The purposes of this project were to review and evaluate Virginia's traffic laws related to pedestrians, compare provisions of the Code of Virginia with those of the statutes of other states and the Uniform Vehicle Code, and, if appropriate, propose amendments, additions, or deletions to the Code of Virginia which would enhance safe walking in the Commonwealth. The study was carried out with the advice assistance of an advisory panel composed of representatives of federal, state, and local governmental agencies, various organizations concerned with the promotion of safe walking as recreation or mobility, the National Committee on Uniform Traffic Laws and Ordinances, and the Tidewater Automobile Association of Virginia. Several general problem areas, in both the context of fatalities and injuries and the Code itself, were identified. The research revealed that there are more injuries to pedestrians in urban areas but more fatalities in rural areas, and that most of those killed and injured are over the age of 15. In addition, it was found that the three most dangerous situations for the pedestrian are crossing at locations other than an intersection, crossing at nonsignalized intersections, and walking in the roadway in the direction of traffic. Also, while crashes involving pedestrians with visual handicaps do not constitute a large percentage of the total, they do warrant special attention. Finally, provisions of the state code are not sufficiently protective of the pedestrian's rights nor definitive of the pedestrian's duties to provide for a safe walking environment. A number of suggestions for revisions to the Code are made to clarify the actions required of pedestrians and motorists at intersections, and pedestrians walking along the highway, crossing roadways at points other than intersections, working in the roadway or upon the highway, playing in the roadway, and responding to emergency, bridge, or railroad signals. (Author)

Stoke, CB Williams, CL
Virginia Highway & Transportation Research Council VHTRC 82-R27, HS-032 883, Nov. 1981, 21p, 6 Tab.

Order From Virginia Highway & Transportation Research Council, P.O. Box 3817, University Station, Charlottesville, Virginia, 22903

349257

ASSESSING THE SAFETY EFFECTS OF FEDERAL MOTOR VEHICLE SAFETY STANDARD 121

In late 1981 the National Highway Traffic Safety Administration accepted the final technical report of an HSRI study it had been sponsoring for six years, since October, 1975. The purpose of the study was to assess the safety effects of FMVSS 121. Standard 121, put into effect in January, 1975, included a provision that new airbraked trucks sold after that date be capable of braking to a controlled stop from 60 mph in a distance of no more than 245 feet. The rationale was that trucks capable of braking that rapidly would be involved in fewer traffic accidents. The HSRI study examined that question by collecting and analyzing data concerning accident involvements of trucks built before and after Standard 121 vehicles in use during calendar years 1976-1978 had a rate of accident involvement significantly lower or higher than that of comparable pre-121 vehicles. The study conclusions are those of the author and not necessarily those of the NHTSA. (Author)

Campbell, KL Haney, J *HSRI Research Review* Vol. 12 No. 4, Jan. 1982, 8p, 1 Fig., 6 Tab.

349260

NEGLIGENT OPERATOR PROGRAM COSTS AND EFFECTIVENESS, POST LICENSING CONTROL REPORTING AND EVALUATION SYSTEM

The Post Licensing Control Reporting and Evaluation System (PLCRES) provides a continually updated series of reports on the costs and safety impacts of components of the Department of Motor Vehicles (DMV) negligent operator program. The PLCRES system was implemented in response to legislative concern over the cost and benefits of the negligent operator program and the department's desire for rigorous program evaluation data. Recent status reports have not shown favorable cost-benefit figures for some of the program structure by DMV management. As a result, a new post licensing control system has been designed in an effort to increase program effectiveness. Because the existing program configuration is being phased out, the present status report is much briefer than prior PLCRES reports. The Legislative Analyst's Office concurred with the department's decision that an extensive final report was not justified given the fact than the negligent operator program structure was to undergo a radical revamping. A new evaluation system will be developed to provide ongoing effectiveness data on the restructured negligent operator program. The reader is referred to the prior reports for a complete description of the PLCRES reporting system and the procedures, methods, and statistical techniques used in the present report. The present data includes subjects entering from March, 1980 to September, 1981. (Author)

Wootton, P Peck, RC Carpenter, DW
California State Department of Motor Vehicles Summary Peridoic Status Rpt7, Dec. 1981, 11p

Copies of Status Reports 1-7 are available from the Research and Development Office of the California Dept. of Motor Vehicles.

ORDER FROM: California State Department of Motor Vehicles, P.O. Box 11828, 2415 1st Avenue, Sacramento, California, 95818

349261

FACTORS ASSOCIATED WITH FATAL ACCIDENT INVOLVEMENT AMONG CALIFORNIA DRIVERS

The primary objectives of this study were to examine characteristics of drivers involved in fatal accidents and to determine if those drivers could be distinguished from California's general driving population on the basis of prior driving record. A sample of drivers involved in 1970-71 fatal accidents was analyzed and compared to a sample of drivers from the general driving population during the same time period. The accident group analyses indicated moderate ability to identify fatal accident types that could be differentiated on the basis of the driver's prior characteristics. Specifically, drivers who had been drinking prior to the accident, who were considered "at fault" for the accident, or whose accident occurred at night were found to have worse prior driving records than other fatal accident-involved drivers. The results also indicated that, as a whole, drivers involved in fatal accidents evidenced worse violation and/or accident records, as well as different demographic and license characteristics than drivers in the general population. However, the classification functions derived to predict fatal accidents did not differ greatly from regression equations that have been constructed to predict total accidents. It was therefore concluded that prediction systems keyed to total accidents will, to a large extent, also identify high risk fatal accident drivers. (Author)

Garretson, M Peck, RC
California State Department of Motor Vehicles CAL-DMV-RSS-81-79, Dec. 1981, 49p, Tab., Refs., Apps.

349262

AN EVALUATION OF THREE ALTERNATIVE FORMATS FOR PROBATION VIOLATOR HEARINGS

Funding was obtained from the California Office of Traffic Safety (OTS 057702) to conduct the project titled "Optimization of the Probation Violator Hearing Format." The project scope, as stated in the grant application, is "...to develop and evaluate new strategies for the probation violator hearing." Major project objectives are to: develop a behavior modification strategy (including contingency contract methodologies) for use by the DIA in the probation violator hearing setting; train selected DIA staff methodologies; and implement and evaluate probation violator hearing formats in selected pilot field offices. The first three objectives have been met by prior publications (Tosti, Hagen, & Williams, 1978; Williams & Hagen, 1978) and by training more than 100 driver improvement personnel. An interim report (Hagen & Williams, 1979) was prepared. The interim report contributed to the creation of a divisional task force which explored several issues relating to driver improvement performance and work climate. The present report overviews the completed objectives and fully documents project implementation and evaluation activities. (Author)

Williams, RL Hagen, RE
California State Department of Motor Vehicles, (Report 77) CAL-DMV-RSS-81-77, Dec. 1981, 77p, Figs., Tabs., Phots., Refs., Apps.

349269

TRACES OF ACCIDENTS SHOULD NOT BE UNNECESSARILY OBLITERATED [UNFALLSPUREN NICHT UNNOETIG VERWISCHEN]

Every accident manifests itself as an interaction between persons and vehicles. In reconstructing accidents a basis is provided by the initial situation, since traces are defined as the material changes of the initial and end situations. For every accident a super matrix can be produced, which is made up from numerous individual traces (deformation, rubbed marks, material examination, damage to clothing, particular textile structures, injuries). In some 50 percent of road accidents it is possible to carry out a reconstruction from the injury report alone. In view of the social consequences of accident injuries the following information is required: detailed medical reports concerning the form, position and degree of external injuries (where possible with photographic documentation) and the preservation of the clothing of accident victims, even with minor injuries. (TRRL) [German]

Schellmann, B *Muenchener Medizische Wochenschrift* Vol. 123 No. 2, 1981, pp 36-37, 2 Phot., 2 Ref.

ACKNOWLEDGMENT: TRRL (IRRD 312752), Federal Institute of Road Research, West Germany

349275

INTERNATIONAL COLLABORATION IN THE FIELD OF ACCIDENT RESEARCH [INTERNATIONALE ZUSAMMENARBEIT DES BEREICHS UNFALLFORSCHUNG]

The report provides information of possible forms of international collaboration in accident research and introduces new examples to this end. One method concerns the exchange of information regarding completed research work, current work programmes, planned research programmes, descriptions of major medium term research efforts, government proposals to parliamentary organs and reports on the activities and organisational programmes of the co-operating institutes. Another form concerns the co-ordination of research activities by agreements on information, common discussions concerning objectives and exercises, debates on research capacity and financial resources and by establishing those areas of research and projects suitable for co-operation. A third form concerns the proportional financing of research projects and the sharing of the work involved. As examples of international research co-operation the following projects are mentioned: the research project "Preparedness for Risk, Speed Behavior and Accidents on Motorways" by the International Drivers Behaviour Research Association (IDBRA), the co-operation agreement between the Transportation Research Institute (TRI), Haifa and the Federal Institute for Road Research, Cologne, the working party of Dutch, Austrian, Swiss and German accident researchers, and international collaboration into the area of traffic conflict research. (TRRL) [German]

Zimmermann, G *Zeitschrift fuer Verkehrssicherheit* Vol. 27 No. 2, 1981, pp 34-36

ACKNOWLEDGMENT: TRRL (IRRD 312759), Federal Institute of Road Research, West Germany

349277
ACCIDENT RATES AND HOURLY TRAFFIC FLOWS ON URBAN ROADS [UNFALLRATEN UND STUENDLICHE VERKEHRSSTAERKEN AUF STADTSTRASSEN]

The connection between traffic volumes and accident rates on sections of inner urban roads has been investigated. In order to exclude from further analysis the extremely high accident rates in the limiting region of traffic flows, which are based only on low absolute accident numbers, a normal range of traffic flows was defined. Within this normal range equalizing lines between accident rates and traffic flow were calculated, which enabled the comparison of this relationship for the 19 lengths of road investigated. The rate of increase of the equalizing lines differs greatly from street to street. The Hamburg results do not completely exclude the possibility that within the defined normal range a tendential decline of the accident rate in line with traffic flow could be present. The Munich results do not allow a similar statement to be made, amongst other reasons, because of the low range of observed traffic flow values. (TRRL) [German]

Leutzbach, W Holz, S *Zeitschrift fuer Verkehrssicherheit* Vol. 27 No. 1, 1981, pp 13-17, 5 Fig., 1 Tab., 7 Ref.

ACKNOWLEDGMENT: TRRL (IRRD 312761), Federal Institute of Road Research, West Germany

349278
SUBJECTIVE AND OBJECTIVE ROAD SAFETY OF CHILDREN [SUBJEKTIVE UND OBJEKTIVE VERKEHRSSICHERHEIT VON KINDERN]

The statistics concerning children's road accidents require proposals for their solution which it is expected will take three directions of research. These apply to the three factors inherent in the occurrence of accidents namely child, vehicle driver and environment. So far the explanation for an accident has mainly been looked for within the theoretical assessment of traffic conditions. In contrast to this the model of subjective and objective safety produced by Klebelsberg pursues the objective of describing normal traffic conditions and, above all, road safety. The basic assumption is that the behaviour of the car driver is subject to conditions between subjective and objective safety. Road safety is low when the subjective feeling of safety is greater than that of objective safety. In applying Klebelsberg's model to the child as a road user it proceeds from the premise that subjective safety develops as a result of the maturing process and of learning experience towards a cognitive representation of objective safety. So long as the child is still not conscious of this, its road safety may only be achieved by complete objective safety. In order to be able to create not only planned but also unplanned learning experience in real situations, which is of significance in the formation of subjective safety, a high degree of objective safety is likewise required. From this it follows that road safety for the child, and linked to it a reduction of the number of children's road accidents, cannot be achieved without increasing the objective safety of the residential environment of the child. (TRRL) [German]

Flade, A *Zeitschrift fuer Verkehrssicherheit* Vol. 27 No. 1, 1981, pp 4-7, 2 Fig., 1 Tab., 20 Ref.

ACKNOWLEDGMENT: TRRL (IRRD 312762), Federal Institute of Road Research, West Germany

349328
A MANUFACTURER'S COMMISSION INVESTIGATES LORRY ACCIDENTS [HERSTELLER-KOMMISSION UNTERSUCHT LKW-UNFAELLE]

A vehicle manufacturer has set up an accident investigation commission in order to assess lorry accidents. An agreement was reached between the police and a road safety authority that the commission will be informed without delay of accidents resulting in personal injuries. A 24 hour service was established so that its own investigations could be carried out at the accident site whenever possible. The results of the investigations show that only 2 to 3% of the accidents can be attributed to technical errors. An effective protection against running down cyclists from the side is to be found by the provision of a grid construction on the side of the lorry. The consequences of accidents between lorries and motorcars could be reduced if their bumpers were located at the same level. Injuries to drivers are now counteracted by providing lorries with deformable safety steering wheels, a newly developed double roller safety belt and by an improvement in the working conditions. (TRRL) [German]

TUE-Sicherheit und Zuverlaessigkeit in Wirtschaft Vol. 22 No. 1, 1981, pp 29-30, 4 Phot.

ACKNOWLEDGMENT: TRRL (IRRD 312972), Federal Institute of Road Research, West Germany

349329
SPEED MEASUREMENT AND THE EVALUATION OF ACCIDENT-RELEVANT DATA FOR RIDERS OF 2-WHEELED VEHICLES USING A QUESTIONING PROCESS CARRIED OUT ON A RANDOM BASIS [GESCHWINDIGKEITSMESSUNG UND ERMITTLUNG UNFALLRELEVANTER DATEN VON ZWEIRADFAHRERN DURCH EINE STOCHASTISCH DURCHGEFUEHRTE BEFRAGUNGSAKTION]

An analysis of the accident circumstances of 2 wheeled vehicle riders provides starting points for measures to reduce accident frequency and to lessen the consequences of accidents. However it is only possible to obtain a convincing assertation on the accident-relevant behaviour of 2 wheeled vehicle riders if a simultaneous observation of all those not involved in the accident is carried out. In this connection a research team from the accident-surgery clinic of the Hanover Medical College in co-operation with the Hanover Police, measured speeds of motorcycles, motorised cycles, mopeds and bicycles within a 2-week period using radar equipment. From a detailed questioning process which followed, the most important data were obtained. The investigation shows the speed spectrum of single 2 wheeled vehicles and characteristic situations involving vehicle and drivers. (TRRL) [German]

Otte, D *Zeitschrift fuer Verkehrssicherheit* Vol. 2 No. 1, 1981, pp 18-25, 6 Fig., 4 Tab., 1 Phot., 8 Ref.

ACKNOWLEDGMENT: TRRL (IRRD 312974), Federal Institute of Road Research, West Germany

349442
INVESTIGATION OF FACTORS SIGNIFICANTLY AFFECTING COMMUNITY SEATBELT USAGE

The state of Victoria has enforced seatbelt legislation of the past decade and at the same time carried out a large scale public education campaign. One significant group within the population has not changed its seatbelt usage behaviour. The paper discusses why the nonusage occurs and concludes that public education campaigns alone do not significantly affect behaviour. The two year project is the only reported seatbelt research where both the users' observed behaviour and attitudinal statements were collected and matched. (A). (TRRL)

Wittingslow, GE
Royal Melbourne Institute of Technology Monograph 1981, 18p, 1 Tab., 28 Ref.

ACKNOWLEDGMENT: TRRL (IRRD 255043), Australian Road Research Board

349454
ACCIDENT DATA COLLECTION

The report briefly describes the processing, analysis, usage, and distribution of road accident and traffic control device data carried out by the Main Roads Department of Western Australia over the 1980/81 financial year. The objective of the project was to provide up to date information on road planning, road design, traffic management, Australian road needs surveys, and compiling programme submissions to the Commonwealth Government. Accident data is obtained from the road traffic authority and control device data from departmental field surveys. Data is coded and entered onto a computerised data base which is maintained and operated by the department. A number of different types of reports are produced and distributed. In addition a number of accident studies were undertaken during the year. (Author/TRRL)

Willett, P
Western Australia Main Roads Department, Australia Monograph Aug. 1981, 25p, 1 Fig., Tabs., 12 Ref.

ACKNOWLEDGMENT: TRRL (IRRD 255066), Australian Road Research Board

349490

SAFETY RELATED RECALL CAMPAIGNS FOR MOTOR VEHICLES AND MOTOR VEHICLE EQUIPMENT, INCLUDING TIRES APRIL 1, 1981 TO JUNE 30, 1981

This document contains defect recall campaign analysis by manufacturers both domestic and foreign for motor vehicles, motor vehicle equipment and tires, required by Section 151 of the National Traffic and Motor Vehicle Safety Act of 1966 as amended.

National Highway Traffic Safety Administration HS-805 942, 1981, 10p
Reported to the National Highway Traffic Safety Administration by Domestic and Foreign Vehicle Manufacturers.

Acknowledgment: National Highway Traffic Safety Administration
Order From: GPO

349491

MECHANICS OF PNEUMATIC TIRES

The pneumatic tire has been an integral part of automotive transportation almost since its inception, yet it remains a product whose characteristics are not easily predictable or comprehensible by conventional engineering techniques. This treatise is an attempt to provide a rational descriptive and analytical basis for tire mechanics. Chapters of this book are contributed by active research workers in the fields of rubber and textile properties, friction, material properties, tire stress problems, tire design and construction, vehicle skid and handling, and tire mechanical properties.

National Highway Traffic Safety Administration HS-805 952, 1981, 931p, Figs., Tabs., Refs.

Acknowledgment: National Highway Traffic Safety Administration
Order From: GPO

349492

SYMPOSIUM ON TRAFFIC SAFETY EFFECTIVENESS (IMPACT) EVALUATION PROJECTS

A Symposium on Traffic Safety Program Effectiveness (Impact) Evaluation Projects was held on May 19-21 at Chicago, Illinois. It described traffic safety countermeasure and evaluation project results to decision makers and other users at the state level. Invitees included state governor's highway safety representatives and coordinators, or their designees, and federal and regional administrators from the National Highway Traffic Safety Administration, and the Federal Highway Administration. Presentations were selected from 32 reports submitted by the NHTSA Office of Program and Demonstration Evaluation. These projects were evaluated for the scientific quality of the effectiveness (impact) evaluations conducted and their potential use to the participants. Some 24 participants attended the symposium. They evaluated the event favorably and recommended that it be continued on an annual basis. It was also apparent from the results of surveys conducted before, during, and after the symposium that in selecting projects for presentation at future symposia, more weight should be placed on the criteria of practicality for state use. Also, symposium promotion should be heightened to increase participant attendance. The proceedings were published 3 months following the event.

Planek, TW Race, K Hoskin, A Bryk, JA Miller, T
National Safety Council, National Highway Traffic Safety Administration
Final Rpt. HS-806 050, Aug. 1981, v.p., Tabs., 8 Ref., 9 App.
Contract

DTNH 22-80-C-05164

Acknowledgment: National Highway Traffic Safety Administration
Order From: NTIS

349493

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION'S 1980-81 WORKSHOP SERIES ON ALCOHOL AND OCCUPANT RESTRAINTS--CENTRAL STATES

From November 1980 through April 1981, Dunlap and Associates, Inc., conducted eight workshops on highway safety countermeasures relative to both alcohol and occupant restraints under Contract No. DTNH22-80-C-05158 to the NHTSA. These workshops were held in the central portion of the United States. Seven were bi-state workshops; the eighth was conducted exclusively for individuals from one state. The fifteen states are Arkansas, Illinois, Indiana, Iowa, Kansas, Louisiana, Michigan, Minnesota, Missouri, Nebraska, New Mexico, Ohio, Oklahoma, Texas, and Wisconsin. Each workshop was designed not only to transmit relevant information from NHTSA to the states but also to tailor the information to the participants' needs and interests. The content and format of each workshop were developed through close coordination among state personnel, NHTSA personnel at the national and the regional levels, and contractor personnel. The workshop also served as a forum for state programs and problems as well as a means of communication among participants. A total of 413 persons attended these workshops as participants. In one workshop only one roster was kept, showing a total of 30 persons attended one or both of the two sessions. In the other seven workshops, 240 persons registered for the Alcohol session and 185 for the Restraint (thus, 42 persons attended both). An average of 34 persons attended the Alcohol sessions and 23 attended the Restraint. Overall, the workshops were very favorably received by participants. Based upon participants' comments and the workshop leaders' observations, it is expected that significant improvements in many states' programs will result directly from the workshop experience. Important conclusions were reached concerning the features and characteristics of successful workshops. This report documents the workshop content and procedures, and their evolution throughout the series. Findings, conclusions, and recommendations also are given.

Oates, JF, Jr Bishop, EW
Dunlap and Associates, Incorporated, National Highway Traffic Safety Administration Final Rpt. ED81-6, HS-806 051, July 1981, 75p, 3 Fig., 5 Tab., 3 App.
Contract

DTNH22-80-C-05158

Acknowledgment: National Highway Traffic Safety Administration
Order From: NTIS

349494

AUTOMOTIVE FUEL ECONOMY PROGRAM. FIFTH ANNUAL REPORT TO THE CONGRESS, JANUARY 1981

This is the Fifth Annual Report to the Congress on the Department of Transportation's Automotive Fuel Economy Program. It identifies the accomplishments of the Fuel Economy Program over the five years since its enactment and provides a short history of the events which preceded the Program. The report discusses the automotive industry and the technologies it uses to improve motor vehicle fuel economy, as well as trends in vehicle sales that effect motor fuel use. It also presents some of the issues that will have to be resolved in future Federal policy on automotive fuel economy.

National Highway Traffic Safety Administration HS-805 692, 1981, 150p, 26 Fig., 8 Tab., 5 App.

Acknowledgment: National Highway Traffic Safety Administration
Order From: GPO

349495

NATIONAL SUMMARY REPORT ON THE FINDINGS AND RECOMMENDATIONS OF THE ACCIDENT DATA IMPROVEMENT PLAN

The National Highway Traffic Safety Administration (NHTSA) and the Federal Highway Administration (FHWA) convened a joint Task Force to determine the standards of comparison to be used in their review of accident data collected by the individual States. The Task Force also developed uniform review criteria. They then surveyed each State's accident data system, identifying problems and recommending corrective actions. The reviews were conducted in 1979, 1980 and the spring of 1981. The major portion of this report is devoted to the presentation of the findings, conclusions and recommendations of this Accident Data Improvement Plan (ADIP) project. Also included is a brief discussion of current FHWA and NHTSA program activities to improve traffic records systems, followed by a summation of national objectives determined as a result of the ADIP project findings.

National Highway Traffic Safety Administration, Federal Highway Administration HS-806 033, Aug. 1981, 13p

Acknowledgment: National Highway Traffic Safety Administration
Order From: National Highway Traffic Safety Administration, 400 7th Street, SW, Washington, D.C., 20590

349496

PROCEEDINGS OF THE NATIONAL CONFERENCE ON CHILD PASSENGER PROTECTION, DECEMBER 10-12, 1979, WASHINGTON, D.C.

The National Conference on Child Passenger Protection was held in Washington, D.C., on December 10-12, 1979. This publication contains the conference agenda, a list of attendees, the proceedings of the morning and afternoon sessions of the first day, and the proceedings of the four concurrent workshops held on the second day. There were nine formal presentations covering the various aspects of the conference topic, such as individual and societal costs of accidents involving children, the pediatricians' role in child transportation, factors influencing the use of restraints, child passenger protection law, accident prevention, etc. The four concurrent workshops covered the following areas: public policy; education; communication; and research and evaluation. The conference provided a forum for the exchange of information, recent research findings and technologies to promote the use of child seats and seat belts by young children.

National Highway Traffic Safety Administration Proceeding HS-805 672, 1979, 96p, 40 Fig.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: National Highway Traffic Safety Administration, 400 7th Street, SW, Washington, D.C., 20590

349497

EIGHTH INTERNATIONAL TECHNICAL CONFERENCE ON EXPERIMENTAL SAFETY VEHICLES

This report of the proceedings is divided into 7 sections: (1) Conference Opening and Awards Presentation; (2) Government Status Reports: Federal Republic of Germany, United States Government, Japan, France, Italy, Sweden, Great Britain and the European Experimental Vehicles Committee Status Report; (3) Results of Experimental Safety Vehicle/ Research Safety Vehicle (ESV/RSV) Development: Minicars RSV, Calspan/Chrysler RSV and additional presentations of ESV/RSV Development; (4) Panel Discussion on the ESV Program with Special Regard to Smaller vehicles; (5) Technical Sessions: Restraint Systems, Child Protection, Biomechanics, Dummies, Analysis, Pedestrian Protection, Accident Avoidance, Handling, and Stability Braking; (6) Panel Discussion on Safety, Energy Conservation and Emissions; and (7) Conference Conclusion, including an exhibition of Research Safety Vehicles.

National Highway Traffic Safety Administration HS-805 555, Oct. 1981, 1086p, Figs., Tabs., Phots., Refs.
Sponsored by the Government of the Federal Republic of Germany, hosted by Volkswagenwerk AG and the City of Wolfsburg. Held in Wolfsburg, October 21-24, 1980.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: GPO

349508

THE INITIAL IMPACT OF THE SAFETY-BELT LEGISLATION IN IRELAND

The wearing of safety-belts by front seat occupants of cars and light vans was made compulsory in the republic of Ireland from February 1, 1979. This report considers the effect of the law during the first eleven months of its operation on wearing rates and on the overall severity of injury to car drivers. It is shown that wearing rates doubled from one in four prior to the law's introduction to one in two subsequently. The effect of this increase on the severity of injury to car drivers was minimal. Where information was available on safety-belt wearing, the proportion of car drivers killed or seriously injured subsequent to the laws introduction was 27.4% compared with 27.7% beforehand. The report considers these figures in somewhat more detail, and offers some tentative explanations for these results. In particular, it is pointed out that the results cannot be taken to mean that safety-belts when properly worn are not effective injury reducing devices. It is suggested however, that much higher wearing rates than the one in two achieved are necessary before substantial effects on overall severity become manifest.

Hearne, R *Road Safety* Monograph NRS 255, June 1981, 14p, 2 Fig., 8 Tab., 6 Ref.

ACKNOWLEDGMENT: TRRL (IRRD 259281), Transportation & Soil Mechanics Laboratory, Spain

349527

YOUNG DRIVER ACCIDENTS: MAGNITUDE AND CHARACTERISTICS OF THE PROBLEM

Details are given of the three measurement approaches: collisions-per-person, collisons-per-driver, and collisions-per-miles driven, and of the sources of data on motor vehicle accidents in Canada used in the study. The part of the report devoted to collisions-per-person examines traffic injuries to young persons as a health and safety problem. It shows that young people between the ages of 15 and 24 are at a disproportionally high risk of death and injury. The problem appears to be consistent over time and from jurisdiction to jurisdiction. The section on collisions-per-driver shows that licensed drivers age 16-24 have injury and fatality rates 2 to 3 times greater than other licensed drivers. Young female drivers are at substantially lower risk than young male drivers. The "collisions-per-miles driven" section shows that young drivers are more likely to be on the road, and therefore involved in a fatal accident, than older drivers. Young drivers are less likely than older drivers to have consumed alcohol; when they consume alcohol it is appreciably less than older drivers. Overall, young drivers remain overrepresented in collisions. This suggests that other age-specific factors, such as inexperience, type and condition of vehicle, propensity to engage in risk-taking activities, are important contributing factors.

Mayhew, DR Warren, RA Simpson, HM Haas, GC
Traffic Injury Research Foundation of Canada Monograph 1981, 163p, 25 Fig., 58 Tab., Refs.

ACKNOWLEDGMENT: TRRL (IRRD 259315)

349622

TRAFFIC ACCIDENTS: PROCEDURES ADOPTED IN VARIOUS COUNTRIES FOR ESTIMATING THEIR COSTS OR VALUING THEIR PREVENTION

This paper is derived from work conducted as part of a recent study of the methods wheich can be used to estimate the costs of traffic accidents or to value their prevention, undertaken for the World Bank (Hills and Jones-Lee 1981). As a contribution to that study the author examined the procedures adopted in a number of countries. This paper extends and further reports on that examination. (a) (Author/TRRL)

Silcock, DT (Newcastle upon Tyne University, England) *Transport Reviews* Vol. 2 No. 1, Jan. 1982, pp 79-106, 20 Tab., Refs.

ACKNOWLEDGMENT: TRRL (IRRD 259760)

349640

AUTO ALARM SYSTEMS

A car is stolen every 32 seconds-After just such an experience, the writer decided to protect his replacement car. This short article describes the pros and cons of anti-theft devices.

Doherty, R *AutoWeek* Vol. 31 No. 38, HS-032 258, Sept. 1981, pp 14-15, 2 Phot.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: Crain Consumer Group, 13920 Mount McClellan Avenue, Reno, Nevada, 89506

349641

AT THE CROSSROADS

National Safety Council figures for 1977 to 1979 show that nearly 40 percent of all traffic accidents, both urban and rural, happened at intersections, perhaps because they are confusing to a lot of drivers, or because too many drivers take chances with cross traffic. Some basics of driving at intersections, along with some pictorial examples of right-of-way and turning situations, are presented in this brief article.

Driver Vol. 15 No. 4, HS-032 257, Sept. 1981, pp 10-13, 11 Phot.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: GPO

349642

A CROSS-CLASSIFICATION ANALYSIS OF THE EFFECTIVENESS OF SAFETY HELMETS IN MOTORCYCLE ACCIDENT INJURIES

The objective of this study is to investigate the relationship between head protection and injury characteristics, in order to assess the effectiveness of safety helmets in reducing the likelihood and severity of head injuries in motorcycle accidents. The analysis is based on a systematic sampling of 751 motorcycle accidents from the three-year (1977-79) accident record of 10,729 cases in the State of Wisconsin. The technique of systematic sampling is to take every Kth element from a list, say every tenth or every fifteenth case from the accident file. The systematic sampling satisfies the requirements of a truly random sample as long as there is no bias in the ordering of the original list. In this study a ten percent sample was obtained by taking every 10th case from the accident record. However, because of incomplete reporting, approximately three percent of these cases were dropped. This resulted in a sample size of 751 cases. The 751 cases include 751 drivers and 137 passengers, totaling 888 victims. The effectiveness of the helmet protection is evaluated with respect to each individual accident regarding the use of the helmet and the particular accident situation. For the purpose of determining the dynamic effects of protective equipment on head injuries, the accidents are described by the manner of collision, the type of collision, and speed.

Chang, CJ *ITE Journal* Vol. 51 No. 9, HS-032 267, Sept. 1981, pp 17-25, 6 Fig., 4 Tab., 1 Phot., 6 Ref.

Acknowledgment: National Highway Traffic Safety Administration
Order From: Institute of Transportation Engineers, 525 School Street, SW, Suite 410, Washington, D.C., 20024

349643

EFFECT OF OVERWEIGHT CARBURETOR FLOATS ON FUEL CONSUMPTION AND EMISSIONS OF A 1980 FORD 2.3-LITER ENGINE

The objective of this test was to determine the effect of carburetor float malfunctions on the fuel economy and emissions of a spark-ignition engine. The aim of this project was to generate steady-state engine data in support of previous investigations involving transient cycle vehicle tests. Previous studies have shown that nitrile rubber carburetor floats have a tendency to absorb gasoline over a period of time. This results in a heavier-than-stock carburetor float and a consequent change in fuel level within the float bowl. This alters the carburetor's calibration and effects the fuel consumption and emissions characteristics of the engine.

Simeone, LF Maider, RK
Transportation Systems Center Test Rpt. ARL-TR-81-15, HS-032 273, Aug. 1981, v.p., 5 Fig., Tabs., 2 Ref., 1 App.
Reference copy only.

Acknowledgment: National Highway Traffic Safety Administration
Order From: TSC

349644

COMPARISON OF THE EFFECTS OF VIDEOTAPED TRAFFIC SAFETY MESSAGES FOR PRESCHOOL CHILDREN

This study compares the effectiveness of two videotaped traffic safety messages, both concerning the task of crossing in the vicinity of parked cars. In the "instructional" version the message was presented according to the principles generally used in media presentations for children, the "modeling" version closely followed the recommendations derived from experimental studies concerning media presentations to children. Both versions were presented to subjects five years of age. The subjects were pretested and posttested on crossing behaviour with the use of a table top model, and their comprehension of the film content was tested after presentation of the material. The "modeling" version resulted in a significant increase in the children's capability to demonstrate the required behaviour, whereas the "instructional" version did not. The comprehension test demonstrated that children exposed to the "modeling" version showed a significantly higher level of understanding than the children exposed to the "instructional" version. The conclusion is drawn that if certain conditions concerning the principles of presentation are followed, media presentation of traffic safety messages may be an useful tool in traffic education for preschool children.

Rothengatter, T Dijkstra, G Ruyter, L de
Groningen University, Netherlands VK 79-16, HS-032 264, No Date, 19p, Refs.

Acknowledgment: National Highway Traffic Safety Administration
Order From: Groningen University, Netherlands, Traffic Research Centre, P.O. Box 14, 9750AA Haren, Netherlands

349645

CAR DRIVERS' PATTERN OF EYE FIXATIONS ON THE ROAD AND IN THE LABORATORY

Car drivers' eye fixations were registered while driving a car on the road or when in the laboratory viewing a slide which showed the same traffic situation. Even when the subjects of the second group were instructed to observe the slide presented as if they were driving there, they fixated their eyes on well-defined targets with quite different frequencies than those motorists who actually drove the car on the road. Furthermore, prolonged fixation times were observed in the laboratory as compared to the road-driving condition. The magnitude of the obtained differences was rather great. The results suggest that the subjects on the road fixated more task-oriented targets and also picked up more information per time unit than their counterparts in the laboratory. The results are discussed in relation to the experimental design.

Cohen, AS (Swiss Federal Institute of Technology) *Perceptual and Motor Skills* Vol. 52 No. 2, HS-032 261, Apr. 1981, pp 515-522, 1 Fig., Refs.

Acknowledgment: National Highway Traffic Safety Administration
Order From: Perceptual and Motor Skills, P.O. Box 9229, Missoula, Montana, 59807

349646

THE ASSESSMENT OF GUIDE SIGN INFORMATIONAL LOAD

The informational load of highway guide signs was measured in laboratory experimentation by having subjects view projected highway signs and choose the highway lanes leading to preassigned destinations. The informational load was measured in terms of response times and errors. Subjects were able to very quickly select the proper lane when they viewed common freeway signs and fictitious signs with as many as eight possible destinations. The inclusion on the sign display of unfamiliar destinations and nonguidance information did not appreciably slow subjects' responses. When the destination was not on the sign, subjects had to make navigational decisions, relating sign information to what they knew about the routes. The associated response times were significantly longer than when scanning alone was required. The findings are interpreted in terms of their implications for the design of highway signs.

Gordon, DA *Human Factors* Vol. 23 No. 4, HS-032 256, Aug. 1981, pp 453-466, 7 Fig., 4 Tab., Refs.
Direct requests to Dr. Donald A. Gordon, Federal Highway Administration, Office of Research, HRS-31, 400 7th Street, SW, Washington, D.C. 20590.

Acknowledgment: National Highway Traffic Safety Administration
Order From: Federal Highway Administration, Office of Research, 400 7th Street, SW, Washington, D.C., 20590

349647

TRAFFIC SURVEY--CHILDREN AS ACTIVE TRAFFIC ACCIDENT PARTICIPANTS

Children suffer excessive morbidity and mortality from traffic accidents in New Zealand. Pedestrian and bicycle accidents constitute one-third of these accidents. The pattern of involvement of children in such incidents may suggest specific preventive measures.

Lennon, D Elliott, RB (Auckland University, New Zealand) *New Zealand Medical Journal* Vol. 92 No. 699, HS-032 262, Oct. 1980, pp 286-289, 5 Fig., 3 Tab., 3 Ref.

Acknowledgment: National Highway Traffic Safety Administration
Order From: Otago Daily Times, Limited, Box 181, Dunedin, New Zealand

349648

DIGITAL SIMULATION FOR AUTOMOBILE MANEUVERS

A new all-digital simulation of automobile handling allows severe maneuvers involving braking or acceleration and cornering. A novel feature is the incorporation of closed-loop control based on a mathematical model of the human driver. The program is modular and well-documented. The model includes provisions for nonlinear tire and suspension forces and moments; it also allows the user to switch off the nonlinearities and to include an antilock brake system.

Garrott, WR (Vehicle Research and Test Center) Wilson, DL Scott, RA (Michigan University, Ann Arbor) *Simulation* Vol. 37 No. 3, HS-032 270, Sept. 1981, pp 83-91, 15 Fig., 3 Tab., 11 Ref.

Acknowledgment: National Highway Traffic Safety Administration
Order From: Simulation Councils, Incorporated, P.O. Box 2228, La Jolla, California, 92038

349649

THE EFFECTS OF CLOBAZAM AND LORAZEPAM ON ASPECTS OF PSYCHOMOTOR PERFORMANCE AND CAR HANDLING ABILITY

Laboratory tests of psychomotor performance and "on road" assessments of car handling ability were made following repeated doses of clobazam 10 mg three times daily, lorazepam 1 mg three times daily and matching placebo 1 capsule three times daily. Both active compounds produced an impairment, compared to placebo, in some mental arithmetic and letter cancellation tasks, but these effects were neither widespread nor consistent. Lorazepam produced a significant impairment of car driving tasks and analogue rating scales of subjective alertness. The pronounced sedative activity of the drug was also shown in the verbal reports of side effects and in indices of early morning sedation derived from the Leeds Sleep Evaluation Questionnaire. Clobazam did not produce either the objective, or the subjective impairment of performance and alertness found with lorazepam. The results taken as a whoie show important differences between the 1,4 benzodizaepine, lorazepam, and the 1,5 benzodiazepine, clobazam, in their effects on the integrity of psychomotor performance related to car driving ability.

Hindmarch, I Gudgeon, AC (Leeds University, England) *British Journal of Clinical Pharmacology* Vol. 10 No. 2, HS-032 274, Aug. 1980, pp 145-150, 1 Fig., 2 Tab., Refs.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: Macmillan Journals Limited, 4 Little Essex Street, London WC2R 3LF, England

349650

DWI REPEATERS AND NON-REPEATERS: A COMPARISON

DWI repeaters differed significantly from non-repeaters on 4 of 23 variables tested. Repeaters were more likely to have zero or two dependent children, attend church frequently, drink occasionally (instead of regularly), and have one or more arrests for public intoxication.

Weeber, S (Mississippi State University) *Journal of Alcohol and Drug Education* Vol. 26 No. 3, HS-032 268, 1981, pp 1-9, 3 Tab., 32 Ref.

Direct requests to Jan Durand, One Rocky Ledge Road, Clinton, Connecticut, 06413.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: Alcohol and Drug Problems Assn of North America, One Rocky Ledge Road, Clinton, Connecticut, 06413

349651

ALCOHOL-RELATED ACCIDENTS AND DUIL ARRESTS IN MICHIGAN: 1978-1979

Twelve years of Michigan accident data, 1968-1979, were analyzed to assess the impact of lowering the minimum legal drinking age from 21 to 18 on January 1, 1972, and subsequently raising it back to age 21 on December 23, 1978. Driver age and the presence or absence of drinking in the accident were the key variables, and partitioning the chi-square statistic into its degrees of freedom was the primary analytic technique. DUIL arrest data were also obtained and analyzed for 1978 and 1979. The results show clearly that the minimum legal drinking age influences drinking-driving patterns among the affected age groups. Alcohol-related accidents increased among 18-to 20-year-old drivers when the legal drinking age was reduced to 18, and non-fatal accidents decreased when it was later increased to 21. The DUIL arrest data strongly indicate that all age groups except 18-20 increased in DUIL arrests from 1978 to 1979, while the 18-20 age group concurrently experienced a decrease. DUIL enforcement indexes--the ratio of DUIL arrests to alcohol-related accidents--were calculated for 1978 and 1979. An index was calculated for the entire state, for each of the 83 counties, and for the 56 Michigan cities having a population of at least 20,000.

Filkins, LD Flora, JD
Highway Safety Research Institute, Michigan Department of State Police
Intrm Rpt. UM-HSRI-81-24, HS-032 251, Apr. 1981, 88p, 5 Fig., 30 Tab., 10 Ref.
Contract

MAL-79-002B

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: Highway Safety Research Institute, Huron Parkway and Baxter Road, Ann Arbor, Michigan, 48109

349652

DETERMINANTS OF TIME HEADWAY ADOPTED BY TRUCK DRIVERS

As a measure of driving performance, time headway provides a way of representing the total interaction between a driver, his vehicle and the road environment as well as an exact description of episodes of dangerously close following. This paper presents the results of a field experiment on the effects on time headway of prolonged driving in a continuous convoy situation. In all, 12 professional truck drivers in two age groups were used. Each drove an instrumented 7 ton rigid van-type heavy goods vehicle for 11 hours on each of 4 consecutive days. Time headway was measured using a closed-circuit television system designed to provide a continuous record of instantaneous time headway. Conditions under which the drivers' following performances were measured were different types of following manoeuvre, prolonged driving and early and late shifts. Comparison with the results of an earlier study of incidental episodes of vehicle following provided an evaluation of the effects of infrequent versus continuous following. The results showed that time headways in convoy driving are much lower than in naturally occurring following situations, particularly for steady-state following during daytime hours. It also appears that drivers need a period of time to adjust to the demands of convoy driving and that driving at night requires longer time headways. No evidence of an increase in performance riskiness was found either during the 11 hour driving day or cumulatively over the 4 days of the experiment.

Fuller, RGC (Trinity College, Ireland) *Ergonomics* Vol. 24 No. 6, HS-032 269, June 1981, pp 463-474, 4 Tab., Refs.

Presented at International Conference on Road Safety, University of Wales Institute of Science and Technology, (UWIST), Cardiff, UK, 7-11 September 1981.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: Taylor and Francis Limited, 4 John Street, London WC1N 2ET, England

349653

CONFLICTING OBJECTIVES IN REGULATING THE AUTOMOBILE

Federal regulation of automobile safety, emissions, and fuel economy is contradictory. Safety equipment and emissions control reduce fuel economy; reducing the size of automobiles is estimated to increase fatalities by 1400 a year and significantly increase serious injuries. These secondary impacts of regulations roughly double the estimated costs of achieving the individual goals. In formulating regulations, these contradictions must be taken into account, along with the effects on the price of the vehicle and its attractiveness to buyers.

Lave, LB (Carnegie-Mellon University) *Science* Vol. 212 No. 4497, HS-032 266, May 1981, pp 893-899, 5 Fig., 3 Tab., 33 Ref.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: American Association for Advancement of Science, 1515 Massachusetts Avenue, NW, Washington, D.C., 20005

349654

AUTOMOBILE SAFETY REGULATIONS AND DEATH REDUCTIONS IN THE UNITED STATES

The effectiveness of federal automobile safety standards was examined using detailed data on 236,000 vehicles in fatal crashes in the United States during 1975-1978. Controlling statistically for type of regulation, types of vehicles, and ages of vehicles, the federal motor vehicle safety standards were associated with substantial reductions in car occupant deaths per 100 million vehicle miles travelled, and some reductions in fatal collisions of the federally regulated vehicles with pedestrians, motorcyclists and bicyclists. Some 37,000 fewer deaths occurred in 1975-1978 than would have been expected without the federal standards.

Robertson, LS *American Journal of Public Health* Vol. 71 No. 8, HS-032 254, Aug. 1981, pp 818-822, 1 Fig., 3 Tab., 18 Ref.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: Robertson, (Leon S), Yale University, Center for Health Studies, New Haven, Connecticut, 06520

349655

BUCKLE-UP BABES

In September 1980 at Grissom AFB, Indiana the "Buckle-Up Babes" program was initiated. It is designed not only to tell parents about the life-saving benefits of seatbelts and child seats, but also to provide the equipment. This article describes how the system works and points out the "safety habit" they are creating among children. The program also serves to motivate parents and older children to use their seatbelts more frequently.

Wartburg, RJ (Grissom AFB) *Driver* Vol. 15 No. 3, HS-032 260, Aug. 1981, pp 8-10, 3 Phot.

ACKNOWLEDGMENT National Highway Traffic Safety Administration
ORDER FROM GPO

349656

ASSESSING REGULATORY IMPACTS: THE FEDERAL EXPERIENCE WITH THE AUTO INDUSTRY

This report assesses the consistency and completeness of publicly available agency analyses of the impacts of regulations affecting automobiles and other motor vehicles. It is based on agency analyses of 56 regulations included in "The Automobile Calendar: Recent and Pending Federal Activities Affecting Motor Vehicles", issued by the U.S. Regulatory Council in January 1981. The report reaches the following conclusions: (1) Fairly complete cost and benefit information is available for 11 (20%) of the regulations reviewed, while cost and benefit estimates are not provided for 19 (34%) of the regulations; (2) Estimates of manufacturer's costs are not developed on the basis of consistent assumptions or through consistent methodologies; (3) Capital expenditures required to meet regulatory requirements are identified for 20 (36%) of the regulations; (4) Retail unit price increases are provided for 26 (43%) of the regulations, but the estimates are not consistent in their treatment of either consumer reactions or retail mark-up factors; and (5) Assumptions and units used to express costs and benefits are not consistent. The report also concludes that: costs and benefits are estimated for each regulation independently of other related regulations, allowing double counting to occur in conducting cumulative analyses; and cost and benefit estimates assume that future product modifications are due solely to federal regulations, which can lead to overestimating the cost impact of a federal regulation.

ICF Incorporated HS-032 255, Mar. 1981, 102p, 13 Tab., 6 App.
Submitted to United States Regulatory Council, March 1981.
Contract

CORC02

ACKNOWLEDGMENT National Highway Traffic Safety Administration
ORDER FROM ICF Incorporated, 1850 K Street, NW, Washington, D.C., 20006

349657

THE COLLECTION AND ANALYSIS OF IN-DEPTH ROAD CRASH DATA

The collection of in-depth road crash data is considered from three perspectives. (1) The problems of sampling are illustrated by reference to several recent studies. (2) The techniques of collecting statements from witnesses are reviewed and the problem of when to stop collecting details is illustrated by consideration of the importance of post-traumatic psychological "sequelae" of road crashes. (3) The training and support systems needed for personnel working on in-depth projects are considered. A simple contributing factor classification technique for the analysis of road crash data is described and its usefulness illustrated by the brief presentation of some results of in-depth studies at the Traffic Accident Research Unit including pedestrian, pedal and motorcycle crashes.

Humphreys, M (New South Wales Dept of Motor Transport, Australia) *Ergonomics* Vol. 24 No. 6, HS-032 263, June 1981, pp 423-435
Presented at International Conference on Road Safety, University of Wales Institute of Science and Technology, (UWIST), Cardiff, UK, 7-11 September 1981.

ACKNOWLEDGMENT National Highway Traffic Safety Administration
ORDER FROM Taylor and Francis Limited, 4 John Street, London WC1N 2ET, England

349658

DO ACCIDENT-INVOLVED DRIVERS EXHIBIT RISKIER EVERYDAY DRIVING BEHAVIOR?

For more than forty years researchers have tried to relate traffic accident involvement to how an individual normally drives. Such efforts have not hitherto discovered clear effects. This study establishes statistically significant relations between a driver's prior involvement in accidents and an observed characteristic of his everyday driving. The observed driving characteristic is his following headway in high flow freeway traffic, defined as the time interval he allows between his vehicle and one he is following. This headway is interpreted as a measure of risk. It is found that accident-involved drivers are more likely to follow with short headways (less than one second) than accident-free drivers. A similar effect is found in comparing drivers with and without traffic violations. Records of accident involvement and traffic violations were obtained (with the cooperation of the Michigan Department of State) for 2576 unidentified drivers observed travelling on a local freeway in high flow afternoon rush hour traffic. The observational data consisted of a measure of the headway and a photograph of each vehicle from which the license plate number was read. In most cases the license plate number provided the driver license number of the registered owner. Cases were excluded if the sex and age of the driver observed in the photograph did not match the owner information. The traffic violation and accident records available from the driver license file were used to examine following headway as a function of driver record. Based on their observed closer following in freeway traffic it is concluded that accident-involved drivers and drivers cited for violations exhibit higher levels of risk in everyday driving than accident-free and citation-free drivers.

Evans, L Wasielewski, P
General Motors Research Laboratories GMR-3362, HS-032 271, July 1980, 15p, 6 Fig., 5 Tab., 7 Ref.

ACKNOWLEDGMENT National Highway Traffic Safety Administration
ORDER FROM General Motors Research Laboratories, Twelve Mile and Mound Roads, Warren, Michigan, 48090

349659

COMPULSORY SEAT BELT USAGE AND DRIVER RISK TAKING BEHAVIOR

The danger compensation principle contends that the use of certain vehicle safety features such as seat belts may induce drivers to take greater risks. To test for this hypothesized effect, observational data on seat belt usage and driver risk taking were collected on 4812 drivers in Ontario, Canada, where seat belt usage is required by law. These data were compared with the results of a similar study conducted in Michigan, which has no usage law. The measure of driver risk taking in both studies was the time duration of following headway maintained by seat belt users and nonusers in high flow freeway traffic. Seat belts were worn by 51% of the Ontario drivers and by 14% of the drivers in Michigan. The Ontario usage rate before the law took effect was similar to the rate observed in the Michigan study. The results of both studies taken together are incompatible with the danger compensation principle. In the two jurisdictions a smaller percentage of users than nonusers drove at close, risky headways of less than one second, and these differences were of the same general magnitude. In the Michigan study it was concluded that voluntary usage is associated with the avoidance of risk. Likewise, in the Ontario study mandatory usage, rather than producing a tendency for increased risk taking as suggested by the danger compensation principle, was also associated with the avoidance of risk. Since the results provide no evidence for a danger compensation effect in car following behavior, it was concluded that this study presents no evidence that the safety benefits of seat belts would be diminished or neutralized by greater driver risk taking.

Evans, L Wasielewski, L Buseck, CR von
General Motors Research Laboratories GMR-3413, HS-032 265, Sept. 1980, 10p, 2 Fig., 1 Tab., Refs.

ACKNOWLEDGMENT National Highway Traffic Safety Administration
ORDER FROM General Motors Research Laboratories, Twelve Mile and Mound Roads, Warren, Michigan, 48090

349660

AUTOMOTIVE FUEL ECONOMY IMPROVEMENT

Fuel economy improvements, attained to date and projected between 1980 and 1985, are discussed. The data, projections and judgements are limited in most cases to General Motors products. The prospects are favorable for continued gains beyond 1985 that include changes in both technology and product mix and entail considerable economic costs. The development of synthetic fuels promises to be cost effective and to require no drastic changes in transportation hardware.

Agnew, WG
General Motors Research Laboratories GMR-3493, HS-032 259, Nov. 1980, 23p, 9 Fig.
For presentation at the American Association for the Advancement of

Science. Toronto, Ontario, Canada. January 8, 1981.
Acknowledgment National Highway Traffic Safety Administration
Order From General Motors Research Laboratories, Twelve Mile and Mound Roads, Warren, Michigan, 48090

349661

RULES OF THE ROAD RATED

This Commentary presents an annual rating of state traffic laws to show how they compare with the rules of the road part of the Uniform Vehicle Code as of January 1, 1980. This rating covers 1979 state traffic laws but does not include changes adopted by state legislatures in 1980. This rating does include changes in the Uniform Vehicle Code which were adopted by the National Committee on Uniform Traffic Laws and Ordinances when it met in August of 1979. This Commentary attempts to provide a precise picture of the status of state traffic laws as of January 1, 1980 that will facilitate rapid identification of particular areas of a state's laws that may not be in substantial conformity with the Code, indicate areas of the statutory law where uniformity may be markedly poor on a nationwide basis, and identify states whose traffic laws may need substantial attention on a priority basis as part of contemporary efforts to improve highway safety. This document, when used with "Traffic Laws Annotated", is particularly useful in determining which laws in any one state differ from provisions in the Uniform Vehicle Code (and from laws in other states).

Kearney, EF (National Committee on Uniform Traf Laws & Ordinanc) *Traffic Laws Commentary* Vol. 10 No. 3, HS-805 986, May 1981, 33p, Tabs., 2 App.
Contract

DOT-HS-8-01952

Acknowledgment National Highway Traffic Safety Administration
Order From GPO

349662

DRIVER LICENSING LAWS AFFECTING HANDICAPPED DRIVERS

This Commentary evaluates the statutory laws which form the framework for balancing the needs of the handicapped person for mobility afforded by having a license and the needs of the public for protection from unsafe drivers. The Commentary focuses on and examines the state laws with specific application to the handicapped and the state laws which affect the handicapped without having specifically applicable provisions. In each instance the pertinent licensing provisions of Chapter 6 of the Uniform Vehicle Code and the comparable state statutes are covered. The scope of the Commentary is limited to the state statutes enacted as of January 1, 1981, and does not consider any state regulations. The Commentary examines those laws affecting persons with physical or mental handicaps such as impaired vision and hearing, permanent loss of a limb or eye, disorders that could result in periodic lapses of consciousness, mental illness or retardation, and aging.

Liner, SA (National Committee on Uniform Traf Laws & Ordinanc) *Traffic Laws Commentary* Vol. 10 No. 4, HS-805 987, June 1981, 57p
Contract

DOT-HS-8-01952

Acknowledgment National Highway Traffic Safety Administration
Order From GPO

349663

RULES OF THE ROAD RATED 1980

This Commentary presents an annual rating of state traffic laws to show how they compare with the rules of the road part of the Uniform Vehicle Code as of January 1, 1981. This rating covers 1980 state traffic laws but does not include changes adopted by state legislatures in 1981. This rating does include changes in the Uniform Vehicle Code which were adopted by the National Committee on Uniform Traffic Laws and Ordinances when it met in August of 1979. This Commentary attempts to provide a precise picture of the status of state traffic laws as of January 1, 1981 that will facilitate rapid identification of particular areas of a state's law that may not be in substantial conformity with the Code, indicate areas of the statutory law where uniformity may be markedly poor on a nationwide basis, and identify states whose traffic laws may need substantial attention on a priority basis as part of contemporary efforts to improve highway safety. This document, when used with "Traffic Laws Annotated", is particularly useful in determining which laws in any one state differ from provisions in the Uniform Vehicle Code (and from laws in other states).

Kearney, EF (National Committee on Uniform Traf Laws & Ordinanc) *Traffic Laws Commentary* Vol. 10 No. 5, HS-806 042, July 1981, 33p, Tabs., 2 App.
Contract

DTNH22-81-C-05110

Acknowledgment National Highway Traffic Safety Administration
Order From GPO

349664

SUPPLEMENT TO BICYCLING LAWS IN THE UNITED STATES 1974-1980

This is an update of information contained in an earlier Commentary, "Bicycling Laws in the United States", designed to be used with the original Commentary, as a supplement to that document. The Supplement covers changes in state vehicle codes in the seven-year period from 1974 through 1980. Together the original Commentary and the Supplement reflect the status of state laws as of January 1, 1981. The original Commentary reviewed the laws of 50 states and the ordinances of 50 selected municipalities. The Supplement updates this information only as to the 50 states and the District of Columbia. It does not update the information regarding the 50 municipalities except as to the District of Columbia.

English, JW Denis, AJR (National Committee on Uniform Traf Laws & Ordinanc) *Traffic Laws Commentary* Vol. 10 No. 6, HS-806 043, Aug 1981, 138p
Contract

DTNH22-81-C-05098

Acknowledgment National Highway Traffic Safety Administration
Order From GPO

349813

IMPACT OF REPEAL OF MOTORCYCLE HELMET LAW

This study was designed to determine if changes have occurred in the death and injury rates after the repeal of the Kansas mandatory helmet law in 1976 and secondarily to check the thesis that the use of helmets did, in fact, reduce death and disability from motorcycle accidents. It was conducted in Kansas for two, three month periods, before and after the legislation was repealed. The number of accidents, the number of motorcycle registrations, the injury severity, the rate of injury and the number of fatalities were studied. The use of helmets during these periods and the use of helmets during accidents were also determined. Statistics show that without doubt, mandatory helmet legislation affects usage and this in turn dramatically reduces the death and injury rates. There is also a reduction in the accident rate associated with helmet usage.

McSwain, NE, Jr Lummis, M *Surgery, Gynecology and Obstetrics* Vol 151 No. 2, HS-032 292, Aug. 1980, pp 215-224, 15 Fig., 6 Tab.
Contract

DOT-HS-7-01563

Acknowledgment National Highway Traffic Safety Administration
Order From Franklin H Martin Memorial Foundation, 55 East Erie Street, Chicago, Illinois, 60611

349814

HELMET USE, HELMET USE LAWS, AND MOTORCYCLIST FATALITIES

This is a rebuttal of a previous article "Perspective on the Public Good" written in this journal by R.J. Perkins criticizing an earlier study done by the authors of the present analysis. These authors now attempt to show that, contrary to Perkins' statements, their previous conclusion accurately describes the consequences of repealing helmet use laws.

Watson, GS (Princeton University) Zador, PL (Insurance Institute for Highway Safety) Wilks, A (Bell Laboratories) *American Journal of Public Health* Vol. 71 No. 3, HS-032 283, Mar. 1981, pp 297-300, 1 Fig., 1 Tab., 10 Ref.

Watson GS, Zador PL, Wilks A: The repeal of helmet use laws and increased motorcyclist mortality in the United States, 1975-1978. American Journal of Public Health 1980; 70:579-585. Perkins RJ: Perspective on the public good. American Journal of Public Health 1981; 71:294-295.

Acknowledgment National Highway Traffic Safety Administration
Order From Insurance Institute for Highway Safety, Zador (Paul L), Watergate 600, Suite 300, Washington, D.C., 20037

349815

HIGHWAY ACCIDENT REPORT--EAST SIDE CHURCH OF CHRIST BUS SKID AND OVERTURN, U.S. ROUTE 183, NEAR LULING, TEXAS, NOVEMBER 16, 1980

About 7:25 a.m., central standard time, November 16, 1980, an intercity-type bus was traveling south on U.S. Route 183, a two-lane rural highway in south-central Texas. It was raining and the pavement was wet. As the bus approached and attempted to negotiate a curve to the left, the rear tires of the bus lost traction. The bus skidded across the opposing traffic lane and onto the shoulder before it could be steered back onto the highway. As it crossed the highway again, the bus spun 180 deg and slid into a drainage ditch where it struck the side of the ditch and overturned onto its left side. Two passengers were killed, and the busdriver and 35 passengers were injured. The National Transportation Safety Board determined that the probable cause of the accident was the low wet cornering capability of the marginal yet "legal" rear bus tires and the low frictional quality of the wet pavement, which combined to produce loss of rear tire traction and vehicle control as the bus was being operated at or near the posted 55 mph speed limit.

National Transportation Safety Board NTSB-HAR-81-4, HS-032 288, July 1981, 39p, 15 Fig., 4 Tab.

Acknowledgment: National Highway Traffic Safety Administration
Order From: NTIS

PB81-233462

349816

ARIZONA TRAFFIC ACCIDENT SUMMARY--1980

This report, based on all traffic accident reports submitted to the Arizona Department of Transportation, is divided into eight sections: (1) Highlights and historical trends; (2) Geographic location; (3) Accident description; (4) Motor vehicle and driver characteristics; (5) Alcohol related accidents; (5) Pedestrian and pedalcyclist accidents; (7) Motorcycle accidents; and (8) School bus accidents.

Arizona Department of Transportation HS-032 312, 1980, 56p

Acknowledgment: National Highway Traffic Safety Administration
Order From: Arizona Department of Transportation, 206 South 17th Avenue, Phoenix, Arizona, 85007

349817

AUTO PARTS PRODUCERS EXPAND EXPORT EFFORTS

The U.S. automotive parts industry, facing growing penetration by imported parts and a severe recession in the domestic market, has now set its sights on carving out a bigger export business. Many of the steps they are taking are "firsts" for these American producers. The long-range outlook is a mixture of hard work and some promising prospects.

Business America Vol. 4 No. 13, HS-032 313, June 1981, pp 12-14

Acknowledgment: National Highway Traffic Safety Administration
Order From: Department of Commerce, 14th Between E Street & Constitution Ave, NW, Room 3811, Washington, D.C., 20230

349818

AUTOMATIC TREAD GAGING MACHINE

An automatic tread gaging machine has been developed. It consists of three component systems: (1) a laser gaging head, (2) a tire handling device, and (3) a computer that controls the movement of the tire handling machine, processes the data, and computes the least-squares straight line from which a wear rate may be estimated. Experimental tests show that the machine has good repeatability. In comparisons with measurements obtained by a hand gage, the automatic machine gives smaller average groove depths. The difference before and after a period of wear for both methods of measurement are the same. Wear rates estimated from the slopes of straight lines fitted to both sets of data are not significantly different.

Ludwig, GS Brenner, FC (National Highway Traffic Safety Administration) *Tire Science and Technology* Vol. 7 No. 1-2, HS-032 315, Jan. 1979, pp 31-39, 6 Fig., 4 Tab., 1 Ref.

Acknowledgment: National Highway Traffic Safety Administration
Order From: American Society for Testing and Materials, 1916 Race Street, Philadelphia, Pennsylvania, 19103

349819

THE ADEQUACY OF LINEAR MODELS IN TREAD LIFE TESTING

This paper examines the assumption of linearity in the application of regression techniques to tread wear data. Data from several sources provide evidence that tread wear is only approximately linear. Linear models appear to be adequate after a sufficient break-in period whose length depends on the nature of the test. When linear models are used to compare the tread life potential of a test tire to that of a control tire, both tires must have had the same testing exposure or else the rate of wear may be overestimated.

Wright, CT (General Motors Proving Ground) *Tire Science and Technology* Vol. 7 No. 1-2, HS-032 302, Jan. 1979, pp 14-30, 5 Fig., 7 Tab., 4 Ref.

Acknowledgment: National Highway Traffic Safety Administration
Order From: American Society for Testing and Materials, 1916 Race Street, Philadelphia, Pennsylvania, 19103

349820

AUTOMOBILE INSURANCE LOSSES COLLISION COVERAGES, INITIAL RESULTS FOR 1981 MODELS

This Highway Loss Data Institute report presents results from the collision coverage loss experience of 1981 model year passenger cars during their first seven months of availability. The principal findings are: (a) The initial collision coverage losses for the 1981 models increased over the 1980 model year results from the same calendar period. The overall claim frequency decreased by five percent, but the average loss payment per claim increased by seven percent and the average loss payment per insured vehicle year by two percent. (b) Within each car size group, sports and specialty models had the worst results and regular two-door models had higher collision coverage losses than regular four-door models and station wagons. (c) There were large variations in the collision coverage loss experience of individual vehicle series, even among vehicles of the same size class and body style subgroup.

Highway Loss Data Institute Res Rpt. HLDI R81-1, HS-032 294, July 1981, 44p, 1 Fig., 2 Tab., 6 App.

Acknowledgment: National Highway Traffic Safety Administration
Order From: Highway Loss Data Institute, Watergate 600, Washington, D.C., 20037

349821

HIGHWAY ACCIDENT REPORT--CENTRAL TEXAS BUS LINES, INC., CHARTER BUS, STATE ROUTE 7, NEAR JASPER, ARKANSAS, JUNE 5, 1980

On June 5, 1980, about 12:47 a.m., a northbound Central Texas Bus Lines, Inc., charter bus occupied by the driver and 32 passengers accelerated out of control while descending a long, curved, steep grade on State Route 7 about 1 mile south of Jasper, Arkansas. The bus failed to negotiate a left curve, and ran off the right pavement edge into a drainage channel. The bus continued for 280 feet, impacted a berm at a concrete culvert, was redirected across the highway, and vaulted down a steep embankment. Twenty bus occupants, including the driver, were killed and 13 passengers were injured. The National Transportation Safety Board determines that the probable cause of this accident was a combination of circumstances which resulted in the driver's inability to control the bus as it descended a steep, winding grade. These circumstances included driver fatigue, reduced fuel flow from a nonstandard fuel pump which adversely affected the bus driver's ability to downshift, and the improperly maintained airbrake system. Contributing to the accident was the management decision which permitted dispatching of a driver with inadequate time to complete the trip within permissible hours and the carrier's inadequate preventive maintenance program for this bus.

National Transportation Safety Board NTSB-HAR-81-1, HS-032 286, Jan. 1981, 41p, Figs., 3 App.

Acknowledgment: National Highway Traffic Safety Administration
Order From: NTIS

PB81-178410

349822

HIGHWAY ACCIDENT REPORT--DIRECT TRANSIT LINES, INC., TRACTOR-SEMITRAILER/MULTIPLE-VEHICLE COLLISION AND FIRE, U.S. ROUTE 40, FROSTBURG, MARYLAND, FEBRUARY 18, 1981

On February 18, 1981, about 4:10 p.m. eastern standard time, a tractor-semitrailer loaded with building supplies accelerated out of control while descending a steep 3-mile grade near Frostburg, Maryland. The combination vehicle was traveling eastbound on U.S. Route 40 when it passed and sideswiped a slower moving pickup truck in the eastbound lane. The combination vehicle then entered the city limits of Frostburg, Maryland, where it collided with eight vehicles and pushed them into six other vehicles. The semitrailer uncoupled and overturned, and the tractor pushed another vehicle with two occupants into a three-story commercial building before coming to rest. As a result, an explosion and fire erupted in the building. Three persons were killed, and the truckdriver and 11 vehicle occupants were injured. Property damage was estimated at more than $675,000. The National Transportation Safety Board determines that the probable cause of this accident was the failure of the truckdriver to respond to appropriate regulatory and warning signs and to properly use the service brakes and transmission for speed control purposes which permitted the tractor-semitrailer to accelerate to a high rate of speed before entering the city of Frostburg. Contributing to the accident was the improper adjustment of the trailer's service brakes due to inadequate vehicle maintenance.

National Transportation Safety Board NTSB-HAR-81-3, HS-032 287, July 1981, 32p, 11 Fig., 1 Tab., 4 App.

ACKNOWLEDGMENT National Highway Traffic Safety Administration
ORDER FROM NTIS

PB81-243917

349823

ANALYSIS OF FATAL TRAFFIC CRASHES IN CANADA, 1977-1978--FOCUS: THE IMPAIRED DRIVER

Alcohol impairment has long been recognized as a major contributory element in the occurrence of fatal motor vehicle collisions. Consequently, a wide array of programmes has been introduced in an attempt to reduce the magnitude of the problem. In an effort to monitor the overall effectiveness of societal efforts in this area, the Traffic Injury Research Foundation of Canada has developed a national data base on fatal traffic crashes in seven Canadian provinces. This study reports on alcohol involvement in fatal traffic crashes from 1973 to 1978, with special reference to 1977 and 1978, the most recent years for which such information is available. Data for the present study were abstracted from the files of the Chief Coroner/Medical Examiner or appropriate agency in the provinces of British Columbia, Alberta, Saskatchewan, Manitoba, Ontario, New Brunswick and Prince Edward Island. Information was also collected from other jurisdictions, subject to availability, but was excluded from the report due to low rates of testing for blood alcohol. It is concluded that despite the substantial societal resources devoted to impaired driver countermeasures, little evidence exists that meaningful inroads are being achieved. In fact, despite these efforts the rate of alcohol involvement in fatal crashes has remained fundamentally unchanged since 1973.

Warren, RA Simpson, HM Chattaway, LD
Traffic Injury Research Foundation of Canada HS-032 307, Sept. 1980, 14p, 8 Tab., 11 Ref.

ACKNOWLEDGMENT National Highway Traffic Safety Administration
ORDER FROM Traffic Injury Research Foundation of Canada, 171 Nepean Street, 6th Floor, Ottawa, Ontario K2P 0B4, Canada

349824

AUTOMOBILE INSURANCE THEFT LOSSES BY MAKE AND SERIES--1979 AND 1980 MODELS

This Highway Loss Data Institute report describes variations in both the frequency and size of insurance theft losses involving 1979 and 1980 model year private passenger cars. The principal findings are: (A) There were very large variations in the theft loss experience of different cars. The car with the worst experience had theft losses that were nearly 300 times greater than the results for the car with the best experience; (B) Among the individual vehicle series summarized, the Chevrolet Corvette had the worst theft loss experience in both model years. The best results were obtained by the 1980 Dodge Colt and the 1979 four-door Buick Skylark; (C) In each vehicle size class, sports or specialty models had by far the worst theft loss experience; (D) In most cases, two-door models had a higher frequency of theft losses and higher average claim sizes than corresponding four-door models; (E) In general, theft losses increased with car size; (F) There were no substantial changes in theft patterns for 1979 models between their first and second years of exposure; (G) There was considerable consistency in the results for the two model years, and (H) There were large differences among individual vehicles in the extent to which large claims contributed to the theft loss experience. For example, 28 percent of the theft claims for the 1980 Corvette exceeded $6,000 whereas only 3 percent of the claims for the four-door Chevette exceeded $2,000. It is clear from the data that total thefts (claims which were at, or close to, the full value of the car) contributed much more heavily to overall theft losses for some vehicles than others.

Highway Loss Data Institute Res Rpt. HLDI T80-1, HS-032 319, Apr. 1981, 95p, 7 Fig., Tabs., 5 App.

ACKNOWLEDGMENT National Highway Traffic Safety Administration
ORDER FROM Highway Loss Data Institute, Watergate 600, Washington, D.C., 20037

349825

IN-PLANE AND OUT-OF-PLANE DYNAMICS OF PNEUMATIC TYRES

During the last decade research has been conducted on the dynamics of the tyre considered as a vehicle component. A survey is given of these developments where tyre mass plays an important role. The underlying theoretical considerations concerning the massless tyre have been discussed as well. Two groups of tyre response have been distinguished: the lateral (out-of-plane) response and the vertical/ longitudinal (in-plane) response to motions of the wheel. In both categories tyre compliance, slip and inertia have influence. The dynamic properties of the rolling tyre have been presented in the form of transfer functions and/or differential equations. The frequency of the imposed oscillations is assumed to be below ca. 40 Hz. Non-linear effects and modelling have been briefly touched on.

Pacejka, HB (Delft University of Technology, Netherlands) *Vehicle System Dynamics* Vol. 10 No. 4-5, HS-032 297, Sept. 1981, pp 221-251, 14 Fig., 28 Ref.

ACKNOWLEDGMENT National Highway Traffic Safety Administration
ORDER FROM Swets en Zeitlinger BV, Heereweg 347B, 2161 CA Lisse, Netherlands

349826

ANALYSIS OF FUEL VAPORIZATION IN S.I. ENGINE CYLINDER DURING LOW TEMPERATURE CRANKING

In order to improve the starting of a spark ignition engine under low ambient temperatures, several factors influencing starting were studied from the viewpoint of mixture formation in the cylinder during engine cranking. The amount of vaporized fuel in the cylinder was estimated from the cylinder pressure difference between a neat-air cycle and fuel-air cycle under the same cranking conditions. Spark ignition energy was not supplied. Five single-component, three dual-component, and five full boiling range fuels were used in the experiments. Factors influencing mixture temperature in the cylinder, i.e., cranking speed and ignition timing were also studied. As a result, it was confirmed that the occurrence of first fire depends heavily on mixture strength, that is, the amount of fuel vaporized in the cylinder. In addition, an approach to improving cold engine starting with low volatility fuels was discovered.

Takagi, Y Nakajima, Y Saito, T Iijima, T (Nissan Motor Company, Limited) *JSAE Review* No. 4, HS-032 308, Mar. 1981, pp 26-33, 16 Fig., 2 Tab., 6 Ref.

ACKNOWLEDGMENT National Highway Traffic Safety Administration
ORDER FROM Society of Automotive Engineers of Japan Inc, 10-2 Goban-cho, Chiyoda-ku, Tokyo 102, Japan

349827

AUTOMOBILE INSURANCE LOSSES PERSONAL INJURY PROTECTION AND COLLISION COVERAGES, COMPARISONS OF THE LOSS EXPERIENCE OF TWO-AND FOUR-DOOR CARS 1978,1979, AND 1980 MODELS

This report analyzes differences in the injury and collision, (In this report the term collision refers to the particular type of insurance sold as "Collision" coverage), loss experience between two-and four-door cars. In particular, it examines the influence of three non-vehicle factors--insured driver age, vehicle density of the garaging location, and vehicle use--to determine whether they contribute to the repeatedly documented differences in loss experience between these two body styles. Results were based on the personal injury protection and collision coverage experience of four popular cars that were marketed in two-and four-door versions. Injury results are presented for 1978 and 1979 models and collision results for 1978-1980 models. Principal findings are: (A) In virtually every loss category two-door cars had worse experiences than corresponding four-door cars. These differences were most pronounced for the collision coverage results, but were also present for most of the injury results. There was no evidence that the non-vehicle factors studied were significantly contributing to these differences. (B) Although driver age had a strong influence on the results, it did not account for most of the differences in loss experience between the two car body styles. (C) Vehicle density and vehicle use also influenced the results but did not contribute to the differences in loss experience by body style.

Highway Loss Data Institute Res Rpt. HLDI A-14, HS-032 317, June 1981, 56p, 11 Fig., 21 Tab., 4 App.

ACKNOWLEDGMENT National Highway Traffic Safety Administration
ORDER FROM Highway Loss Data Institute, Watergate 600, Washington, D.C., 20037

349828
INFORMATIONAL REPORT ON THE MEASUREMENT AND CHARACTERIZATION OF DIESEL EXHAUST EMISSIONS

The report provides guidance on selection of methods for collection and analysis of the constituents in diesel exhaust to enable a complete chemical characterization of the exhaust. It was prepared by a thorough review of the state-of-the-art for measuring diesel emissions in 1980. An attempt was made to compile validated, or at least tested, methods and to evaluate their engineering applicability. To establish the state-of-the-art, available methods were reviewed, and an attempt was made to establish whether the following data were available: (1) Procedure details and experimental data; (2) Limits of detection; (3) Precision and accuracy; (4) Problem areas, interferences; (5) Applicability to raw and/or diluted exhaust;(6) Applicability to light-and heavy-duty diesel applications; (7) Resources required; (8) Time constraints, if any. In some cases, sufficient documentation for the use of the method was available in the literature. In other cases, cooperative round-robin testing of the method was conducted by the Panel, and these findings are reported. Some methods were developed by members of the Panel and evaluated by the Panel or outside contractors. In all cases, a status of the method is reported. If the methods review indicated the analytical procedures were adequate, one or more methods are recommended. In many cases, the need for additional research is evident, and recommendations for further research are made. The methods allow complete assessment of the constituents that are of current interest in diesel exhaust. Many of the constituents are minor, but may be of interest in assessing health effects and effects of control technology in other research studies.

Perez, JM, Editor Hills, FJ, Editor Schuetzle, D, Editor Williams, RL, Editor
Coordinating Research Council, Incorporated CRC Report No. 517, HS-032 295, Dec. 1980, 275p, Figs., Tabs., Refs.

ACKNOWLEDGMENT National Highway Traffic Safety Administration
ORDER FROM Coordinating Research Council, Incorporated, 219 Perimeter Center Parkway, Atlanta, Georgia, 30346

349829
ACCIDENT RATE AT URBAN RIGHT-ANGLE INTERSECTIONS

Data on various physical and traffic characteristics from 460 intersections throughout New Zealand were obtained from local authorities, and injury accident records 1965-1969 for the same intersections were obtained from a search of Ministry of Transport files. A series of computer analyses were carried out on the data, the final runs using multiple regression techniques to examine the effects of all the site characteristics on accident frequency simultaneously. A matrix of accident prediction equations were derived which may be used to estimate normal accident rates at specific intersections. Bias in the sample was investigated and was found to be insignificant. Generally it was found that the effect of the variables studied is relatively small. 60% or more of the accident rate is due to chance or to variables not studied. Forms of control have the normally expected effect with accidents reducing as severity of control increases. However, a single level change in control (e.g. Uncontrolled to Give Way or Give Way to Stop) usually produces no change in accident rate.

Kitto, HJ (Jenkins, (TH) and Associates)
National Roads Board, New Zealand RRU Bulletin 48, HS-032 301, 1980, 94p, 8 Ref.

ACKNOWLEDGMENT National Highway Traffic Safety Administration
ORDER FROM National Roads Board, New Zealand, Road Research Unit, Wellington, New Zealand

349830
IMPROVING THE RESIDENTIAL STREET ENVIRONMENT--EXECUTIVE SUMMARY

This Executive Summary capsulizes results of state of the art research on a broad range of techniques for Residential Street Traffic Control or Traffic Management and specific case study research on applications of the TRRL-developed "road hump" on U.S. residential streets. It also summarizes findings of original research on resident preferences regarding traffic speed and volume on residential streets, on factors which affect drivers' speed choice on residential streets and reviews legal considerations in neighborhood traffic management.

Smith, DT, Jr Appleyard, D
De Leuw, Cather and Company, Federal Highway Administration FHWA-RD-81- 30, HS-032 293, May 1981, 14p, 3 Fig.

Prepared in cooperation with Berkeley Planning Associates and DKS Associates.
Contract

DOT-FH-11-9309

ACKNOWLEDGMENT National Highway Traffic Safety Administration
ORDER FROM NTIS

349831
REDUCING EXHAUST SYSTEM NOISE IN HEAVY TRUCK DESIGN

Traffic noise in urban areas is posing a serious problem in many countries of the world, and the reduction of noise in heavy trucks is now a social problem urgently requiring resolution. Four major heavy truck manufacturers have been conducting joint research on the reduction of noise in heavy trucks under the leadership of the Japanese Ministry of International Trade and Industry as a three-year project. The Mitsubishi Motors Corporation is in charge of the reduction of exhaust system noise, which is one of the main sources of vehicle noise. The exhaust system noise of trucks can be divided into discharge noise emitted from the exhaust outlet and radiated noise emanating from the surface of the exhaust pipes and mufflers. This paper reports on the results of experiments performed on the reduction of the exhaust noise of actual trucks on the basis of studies, including acoustic studies and studies of air flow noise and radiated noise.

Inagawa, M Nakamura, K (Mitsubishi Motors Corporation) *International Journal of Vehicle Design* Vol. 2 No. 2, HS-032 289, May 1981, pp 127-144, 17 Fig., 4 Tab., 2 Ref.

ACKNOWLEDGMENT National Highway Traffic Safety Administration
ORDER FROM Inderscience Enterprises Limited, La Motte Chambers, St Helier, Jersey, England

349832
INTERNATIONAL SEAT BELT AND CHILD RESTRAINT USE LAWS

In 1970, the Australian state of Victoria became the first government in the world to make wearing seat belts compulsory. Two years later, the law was extended to all of Australia. Today, 28 countries or provinces are known to have mandatory seat belt laws or ordinances. In the summer of 1980, the American Seat Belt Council (ASBC) surveyed road safety officials in many of these countries and provinces. The survey questionnaire was divided into two parts. Part one dealt with measures in force to protect children involved in automobile accidents. Part two concerned seat belt usage requirements, the history of enforcement efforts, and the effectiveness of the seat belt law. Replies to the survey were received from officials in 21 countries. Many officials included with their responses copies of research, undertaken in their countries on seat belt usage and effectiveness, and seat belt promotional material distributed by their governments. The survey found that the problem of child safety has yet to be adequately addressed. For the most part, governments have directed their attention to adult seat belt usage. The survey also discovered that where seat belt usage was required, and properly enforced, it had increased dramatically once made mandatory and has remained high with the passage of time. Significantly, no government contacted disclosed plans to introduce passive restraint systems such as air bags or automatic belts, in place of active seat belts. Although firm data was sometimes lacking, all officials responding to the survey picked seat belt usage as a significant factor in reducing death and injuries in automobile accidents.

American Seat Belt Council HS-032 298, Apr. 1981, 42p

A Study of Occupant Restraint Use Requirements and Their Impact in Foreign Countries.

Acknowledgment National Highway Traffic Safety Administration
Order From American Seat Belt Council, P.O. Box 467, New Rochelle, New York, 10802

349833

FIRES IN PUBLIC SERVICE VEHICLES IN THE UNITED KINGDOM

Past records show that fires in public service vehicles (PSVs) in the United Kingdom result in few injuries per year. In apparent contradictions of this, there is evidence to suggest that the time it takes for fire to spread through a PSV can be short and can be considerably exceeded by occupant evacuation times via emergency exits. The characteristics of rapid flame spread and slow evacuation times are related to the possibility of a catastrophic collision between a PSV and a potentially high-risk vehicle such as a petrol tanker. Although fire-retarding materials are being used in PSVs, it is doubtful if these will ultimately prevent extensive injuries in an accident of this nature, and the solution seems to hinge on the design of such vehicles as tankers. The cost of a multi-vehicle garage fire is discussed and the importance of garage design in addition to vehicle design is considered.

Johnson, W Walton, AC *International Journal of Vehicle Design* Vol. 2 No. 3, HS-032 279, Aug. 1981, pp 322-334, 3 Fig., 6 Tab., Refs.

Acknowledgment National Highway Traffic Safety Administration
Order From Inderscience Enterprises Limited, La Motte Chambers, St Helier, Jersey, England

349834

FITNESS TO DRIVE A MOTOR VEHICLE

Professional drivers should be required to pass a standard medical test before being issued with a driving licence, this to be repeated at regular intervals thereafter. The requisite standards of fitness are presented as a guide to medical practitioners in South Africa.

Ferguson, AL Hedden, FJ *South African Medical Journal* Vol. 58 No. 14, HS-032 280, Oct. 1980, pp 576-577, 7 Ref.

Acknowledgment National Highway Traffic Safety Administration
Order From Medical Association of South Africa, Box 643, Cape Town 8000, South Africa

349835

THE HERMENEUTICS OF ACCIDENTS AND SAFETY

The engineering aspects of road safety have now become so sophisticated that road accidents have seemingly reached an asymptotic level. Unfortunately this level is well above zero, and the remaining accidents seem to be due not so much to faults in the environmental interface as to carelessness and perversity. Mechanistic models of man are not well equipped to deal with these properties of men, and a different mode of explanation is sought. Hermeneutics is a discipline originally concerned with textual interpretation, which has recently been introduced into psychology, and which focuses on elucidation of the meanings of human actions. Within this framework, it is proposed that accidents are by definition meaningless events, and the meanings of actions antecedent to accidents must be sought elsewhere than in their statistical association with the latter. The implications of this, and some directions for enquiry, are discussed in the paper.

Taylor, DH (Southampton University, England) *Ergonomics* Vol. 24 No. 6, HS-032 284, June 1981, pp 487-495, Refs.

Presented at International Conference on Road Safety, University of Wales Institute of Science and Technology, (UWIST), Cardiff, UK, 7-11 September 1981.

Acknowledgment National Highway Traffic Safety Administration
Order From Taylor and Francis Limited, 4 John Street, London WC1N 2ET, England

349836

THE INTERVIEW IN ACCIDENT INVESTIGATION METHODOLOGICAL PITFALLS

The apparent randomness of traffic accidents effectively guarantees that traffic researchers will never witness more than a handful of collisions. Thus the nature of accidents demands a retrospective method of enquiry, and interviewing procedures have traditionally provided the primary tools in this regard. Potential pitfalls associated with the use of interview procedures in accident research have rarely been elucidated. It is suggested here that the use of interviews in accident investigation are problematic at both the technical and theoretical level. At the technical level demands for accuracy, reliability and consistency in accident reports may promote bias in the accounts offered by witnesses. At the theoretical level retrospective methods generally tend to lead the researcher to infer causal connections between accident antecedents and consequents whereas correlational associations would be more appropriate. Some factors contributing to this sort of erroneous inference are identified. It is shown that "prospective" methods of accident enquiry, such as are incorporated in current traffic conflict techniques, may suffer from similar types of interpretational bias.

Sheehy, NP (University of Wales Institute of Science & Tech) *Ergonomics* Vol. 24 No. 6, HS-032 299, June 1981, pp 437-446, 5 Fig., Refs.

Presented at International Conference on Road Safety, University of Wales Institute of Science and Technology, (UWIST), Cardiff, UK, 7-11 September 1981.

Acknowledgment National Highway Traffic Safety Administration
Order From Taylor and Francis Limited, 4 John Street, London WC1N 2ET, England

349837

HIGH-MOUNTED BRAKE LIGHTS AND THE BEHAVIOR OF FOLLOWING DRIVERS

This daytime study evaluated in-traffic responses of unsuspecting drivers to supplemental, high-mounted brake lights using two different test vehicles (compact and full size) and two different test routes (suburban and urban). The supplemental lamps were mounted just below the rear window or at roof level. Measures were taken of brake-response and vehicle speed-change frequencies, and of the corresponding reaction times. (The speed changes were measured by radar.) The following main results were obtained: The frequency of brake responses and of speed changes did not differ statistically among the systems tested in either of the test vehicle/test route combinations. Brake-reaction times did not vary among the systems tested for any of the test vehicle/test route combinations. Speed-change reaction times also did not vary among the systems tested for any of the test vehicle/ test route combinations with the exception of the compact vehicle/urban route combination: Here, a system with a single, supplemental lamp, center-mounted just below the rear window, was associated with statistically shorter reaction times than the control system. The relation of the present findings to previous behavioral and accident studies of the efficacy of high-mounted brake lights is discussed.

Sivak, M Olson, PL Farmer, KM
Highway Safety Research Institute, Motor Vehicle Manufacturers Assn of the U.S., Inc. (362046) Final Rpt. UM-HSRI-81-31, HS-032 285, July 1981, 33p, 7 Fig., 11 Tab., Refs.

Acknowledgment National Highway Traffic Safety Administration
Order From Highway Safety Research Institute, Huron Parkway and Baxter Road, Ann Arbor, Michigan, 48109

349838

AUTO RULES COULD MOVE DETROIT IN A NEW DIRECTION

This article discusses the advantages to be had from modification of Federal regulations of the auto industry. Various proposed actions relating to EPA and NHTSA regulations are estimated to give a saving of 9,297 million dollars over a five-year period, which yields an approximate 150 dollars per car and truck in potential consumer savings.

Berry, BH *Iron Age* HS-032 314, May 1981, pp 19-22

Acknowledgment National Highway Traffic Safety Administration
Order From Chilton Company, Chilton Way, Radnor, Pennsylvania, 19089

349839

AIR CUSHION RECOVERY SYSTEM

This article discusses the use of air bags to return overturned commercial vehicles, tractor trailers or other heavy vehicles to an upright position. From a demonstration of their use, several facts became obvious: they are time saving, they are cost effective, and they increase the safety of recovery operations involving vehicles transporting hazardous materials. The air cushions are also considered life savers, enabling fast rescue of persons trapped by overturned vehicles, fallen trees, collapsed scaffolding, collapsed tunnels, or in various other emergency situations.

Van Cott, D *California Highway Patrolman* Vol. 45 No. 4, HS-032 303, June 1981, p 10, Phots.

Acknowledgment National Highway Traffic Safety Administration

Order From California Association of Highway Patrolmen, P.O. Box 2631, Sacramento, California, 95812

349840

POOLS, RIDESHARING--THE NEGLECTED MONEY SAVER

This article discusses the advantages of car pooling or van pooling, including cost savings and safety aspects, explains what is involved in setting up a ridesharing arrangement, and presents some of the arguments against ridesharing along with objections to these. In conclusion a few tips are given for making the car or van pool as attractive a program as possible.

Van Pool, C *Driver* Vol. 14 No. 11, HS-032 311, Apr. 1981, 8p, Phots.

Acknowledgment National Highway Traffic Safety Administration
Order From GPO

349841

APRIL DUAL--TWO-UP MOTORCYCLING

A motorcycle ridden by one person does not behave the same way when it is ridden by two. This fact is explained and some advice is given: be sure your machine is capable of handling the load, do not exceed gross axle weight ratings--which means in the case of motorcycles be sure of your tires (some simple rules are given along with a tire equivalent chart and tire size designations) and be sure the second rider knows what he or she is expected to do.

Driver Vol. 14 No. 11, HS-032 310, Apr. 1981, pp 19-21, 3 Phot.

Acknowledgment National Highway Traffic Safety Administration
Order From GPO

349842

FOR YOUR BODY ONLY--BUCKLE UP

This article points out some facts which a person should be aware of before he rejects or ignores the use of a seatbelt. These subjects are considered: what seatbelts can do if they're worn; what causes the injuries to people who don't wear them; and a few of the real reasons people have for failure to buckle up.

Driver Vol. 15 No. 4, HS-032 281, Sept. 1981, 5p, Phots.

Acknowledgment National Highway Traffic Safety Administration
Order From GPO

349843

AMERICAN EXCESS--SOME OBSERVATIONS ON A NATIONAL PASTIME

This article discusses speeding, an "American Excess" that has become a severe problem. The problem exists not only on highways with the national maximum of 55 mph, but also on roads with slower posted limits and where it is a far more serious problem. The problem is made worse by many things, including bad weather and following too close. Speeding causes greater fuel consumption, but those who speed don't seem to care. This article takes a look at some of the reasons given for speeding, and asks the reader to consider his own reasons, then slow down and live.

Driver Vol. 15 No 1, HS-032 305, June 1981, pp 12-16, Phots.

Acknowledgment National Highway Traffic Safety Administration
Order From GPO

349844

AN ANALYSIS OF DRINK DRIVING RESEARCH

This monograph presents a review of the literature on drink driving. It is selective, the major criteria for selection being relevance and availability. The literature is restricted to the years 1971-1978, except where an earlier paper is part of a series or was judged to be particularly important. Chapter 1 is an introduction to the monograph and contains a discussion of bias and methodology, problems encountered in the literature being reviewed. Chapters 2 through 5 contain the major portions of this review and cover, respectively, the following four topics: surveys of drink driving practices, description or predictions of drinking drivers, countermeasures aimed at reducing drink driving, and measurements of drinking and drink driving. Chapter 6 presents a theoretical model based in part on the research reviewed which could be used to guide future studies, to suggest research that needs to be undertaken, and to aid intellectualizing about the likely effectiveness of a countermeasure program. The final chapter, 7, discusses a general approach to an effective countermeasure program, covering three general aspects--the acceptability of the program to the community, the target group at whom it is aimed, and the particular attitude or behavior that the program aims to change.

Andrews, JS Eaton, EG Hore, T, Editor McTaggart, S West, LHT, Editor
Monash University, Australia HS-032 306, 1980, 393p, Figs., Tabs., Refs.

Acknowledgment National Highway Traffic Safety Administration
Order From Monash University, Australia, Higher Education Advisory and Research Unit, Clayton, Victoria 3168, Australia

349845

HYDROGEN AS AUTOMOTIVE FUEL: WHAT DOES THE FUTURE HOLD?

The production, distribution and storage of hydrogen are considered. Its safety and effect on the environment, are reviewed. Its use as an automotive fuel is compared to alternative fuels. The near term conclusion is that its use as an automotive fuel is not for this century, while the longer term conclusion sees its prospects as brighter. Some promising areas of hydrogen-related research are presented.

Automotive Engineering Vol. 89 No. 8, HS-032 291, Aug. 1981, pp 69-74, 6 Fig.

Acknowledgment National Highway Traffic Safety Administration
Order From SAE

349846

THE FEDERAL ROLE IN HIGHWAY SAFETY: A SUCCESS STORY

Some perspectives on the history and future directions of the U.S. Federal Highway Safety Programs are presented. In recent years, the federal government has accepted the responsibility of dealing with the issue of the cost of human and economic damage of highway accidents with new measures of skill and advanced thinking that have produced evidence of success. Continued federal responsibility for highway safety standards and funding is necessary since most states have neither the funds, the capability nor the inclination to set satisfactory safety standards.

Balcar, GP *ITE Journal* Vol. 51 No. 6, HS-032 278, June 1981, pp 51-55

Acknowledgment National Highway Traffic Safety Administration
Order From Institute of Transportation Engineers, 525 School Street, SW, Suite 410, Washington, D.C., 20024

349847

HOW DESIGNERS BUILD MORE MPG INTO NEW LOW-DRAG CARS

There is an intense search for fuel economy through improved aerodynamics: reducing drag reduces fuel consumption. No matter how much the engine is abused, every mile a car is driven, fuel efficiency is improved. Three 1981 car series have received extensive aerodynamic fine-tuning: Ford Escort/Mercury Lynx, Plymouth Reliant/ Dodge Aries, and Pontiac Grand Prix-/Chevrolet Monte Carlo/ Buick Regal/Oldsmobile Cutlass Supreme. Eventually, designers plan to cut the efficiency-gouging coefficient of drag from today's average of 0.40-0.45 down to a practical minimum of about 0.25.

Dunne, J *Popular Science* Vol. 219 No. 3, HS-032 290, Sept. 1981, pp 74-76, 3 Phot.

Acknowledgment National Highway Traffic Safety Administration
Order From Times Mirror Magazines, Incorporated, 380 Madison Avenue, New York, New York, 10017

349848

THE FUEL ECONOMY OF LIGHT VEHICLES

The possibility of making a successful economic transition to the post-petroleum era is contingent on determined efforts by both Government and industry to increase energy efficiency in the sectors of the economy that depend on liquid fuel, particularly the automobile. The path to improved fuel economy combines a number of related and interacting factors: weight reduction, reduction in aerodynamic drag, reduction in rolling resistance, more efficient engines and more efficient transmissions. A specific hypothetical four passenger lightweight vehicle answering these criteria is presented, and two scenarios for the Government to set before the industry in the post 1985 era are proposed.

Gray, CL, Jr Hippel, F von *Scientific American* Vol. 24 No. 5, HS-032 282, May 1981, pp 48-59

Acknowledgment National Highway Traffic Safety Administration
Order From Scientific American Incorporated, 415 Madison Avenue, New York, New York, 10017

349849

ALTERNATIVE BODY PANEL MATERIALS REDUCE WEIGHT, INCREASE COST

The alternative materials considered for body panels in this article are restricted to those which can be manufactured by rapid production methods suitable for the automobile industry. The body panel candidates are conventional sheet metals such as steel and aluminum, desirable because of their suitability in stamping, and chopped-fiber composites such as glass-fiber and carbon-fiber reinforced sheet molding compound, desirable because of the relatively high production rates in compression molding.

Automotive Engineering Vol. 89 No. 4, HS-032 304, Apr. 1981, pp 61-68, 8 Fig., 2 Tab.

Acknowledgment National Highway Traffic Safetv Administration
Order From Society of Automotive Engineers, Incorporated, 400 Commonwealth Drive, Warrendale, Pennsylvania, 15096

349850

ANTI-ROLL BARS--LET'S BELLY UP TO THE BAR, FOLKS, AND SEE WHAT WE CAN LEARN

The effects of anti-roll bars are tested comparatively, with bars variously connected and disconnected in three handling environment: skidpad, slalom and racing circuit. The objective of the test is to share diagnostic skills so one is abie to assess what an anti-roll bar can-and cannot-be expected to do.

Simanaitis, D, Engineering Editor *Road and Track* Vol. 32 No. 12, HS-032 309, Aug. 1981, p 56, 7 Phot.

Acknowledgment National Highway Traffic Safety Administration
Order From CBS Consumer Publishing West, 1499 Monrovia Avenue, Newport Beach, California, 92663

349851

AUTOMOBILE INSURANCE LOSSES PERSONAL INJURY PROTECTION AND COLLISION COVERAGES. RELATIONSHIPS BETWEEN INJURY AND COLLISION LOSSES AND ENGINE OPTIONS FOR SELECTED 1977-1979 COMPACT CARS

This Highway Loss Data Institute report summarizes the injury and collision coverage loss experience of a group of selected 1977 through 1979 compact cars in relation to their engine sizes. The principal findings are: (A) For the specialty models there were pronounced relationships between their collision coverage loss experience and the size of their engines. The cars with the most powerful engines had the worst loss experience; (B) For the specialty models there were no consistent relationships between their injury loss experience and the size of their engines; (C) For the regular two-and four-door models there were no consistent relationships between their loss experience--either injury or collision-- and the size of their engines; and (D) There were consistent differences between the loss experience--both injury and collision--for corresponding two-and four-door models. In virtually every case the results for the two-door models were worse than the results for the corresponding four-door models with the same engine.

Highway Loss Data Institute Res Rpt. HLDI A-15, HS-032 320, June 1981, 27p, 6 Tab., 3 App.

Acknowledgment National Highway Traffic Safety Administration
Order From Highway Loss Data Institute, Watergate 600, Washington, D.C., 20037

349852

THE AUTOMOBILE PASSENGER--A FORGOTTEN MODE

Current practices in urban transportation planning tend to neglect the automobile passenger. This study shows that a large number of urban trips are made as an automobile passenger and that the general characteristics of these passengers are similar to transit passengers rather than automobile drivers. The significance of these findings are discussed in terms of modelling the use of various urban travel modes.

McCoomb, LA (Transport Canada Research and Development Centre) Steuart, GN (Toronto University, Canada) *Transportation Research. Part A: General* Vol. 15A No. 3, HS-032 322, May 1981, pp 257-263, 9 Fig., 1 Tab., 5 Ref.

Acknowledgment National Highway Traffic Safety Administration
Order From Pergamon Press Limited, Headington Hill Hall, Oxford OX3 0BW, England

349853

AUTOMOTIVE POWER STEERING "FEEL"

This paper discusses what is meant by "feel" particularly but not exclusively under high speed driving conditions, what is required to provide a satisfactory "feel" and to discuss how it may be possible to do this. It mainly, but not exclusively, considers motor cars and is basically confined to the modern power steering rotary valve which uses torsion bar springing, since this embraces by far the greatest number of power gears currently made. Most of the illustrations and references relate to rack and pinion steering but, in a general sense, all that is said can be applied to other types of steering gear.

Adams, FJ (Cam Gears Limited) *Institution of Mechanical Engineers Proceedings* Vol. 195 HS-032 323, Mar. 1981, pp 29-36, 11 Fig.

This paper is published for presentation at an Ordinary Meeting of the Automobile Division to be held in London on 10 February 1981.

Acknowledgment National Highway Traffic Safety Administration
Order From Mechanical Engineering Publications Limited, Box 24, Northgate Avenue, Bury St. Edmunds, Suffolk IP32 6PW, England

349854

MOTOR CARRIER ACCIDENT INVESTIGATION

A Westbound tractor semitrailer truck, out of control, sideswept an eastbound tank truck, then overturned on a curve, blocking the eastbound lane. The eastbound ore truck struck and tore away the upper portion of the tractor cab and became enmeshed in the overturned trailer. The results were three fatalities; one injury and $180,000 property damage. The probable cause was excessive speed. The driver lost control of the truck on approach to a 19 degree curve. The contributing factors were the driver's physical inability (paraplegic) to control the truck, deficient steering-pitted shaft and worn bushings.

Federal Highway Administration Report No. 80-7, HS-032 330, Mar. 1981, 12p, 5 Phot.

Acknowledgment National Highway Traffic Safety Administration
Order From Federal Highway Administration, Bureau of Motor Carrier Safety, Washington, D.C., 20590

349855

MOTOR GASOLINES, WINTER 1980-81

Analytical data for 546 samples of motor gasoline, were collected from service stations throughout the country and were analyzed in the laboratories of various refiners, motor manufacturers, and chemical companies. The data were submitted to the Bartlesville Energy Technology Center for study, necessary calculations, and compilation under a cooperative agreement between the Bartlesville Energy Technology Center (BETC) and the American Petroleum Institute (API). The samples represent the products of 23 companies, large and small, which manufacture and supply gasoline. These data are tabulated by groups according to brands (unlabeled) and grades for 17 marketing districts into which the country is divided. A map included in this report, shows marketing areas, districts and sampling locations. The report also includes charts indicating the trends of selected properties of motor fuels since 1959. Sixteen octane distribution percent charts for areas 1, 2, 3, and 4 for unleaded antiknock index (RM)/2 below 90.0, unleaded antiknock index (RM)/2 90.0 and above, leaded antiknock index (RM)/2 below 93.0 and leaded antiknock index (RM)/2 93.0 and above grades of gasoline are presented in this report. The antiknock (octane) index (RM)/2 averages of gasoline sold in this country were 87.6 unleaded below 90.0, 91.4 unleaded 90.0 and above, 89.1 leaded below 93.0, and 93.3 leaded 93.0 and above grades of gasoline.

Shelton, EM
Department of Energy DOE/BETC/PPS-81/3, HS-032 331, July 1981, 64p, 21 Fig., 5 Tab.

Acknowledgment National Highway Traffic Safety Administration
Order From NTIS

349856

MOTORCYCLE FATALITIES: ANALYSIS OF BIRMINGHAM CORONER'S RECORDS

Analysis of the evidence from 55 coroner's inquests concerning 51 separate motorcycle accidents is reported. Fatal injuries were frequently associated with excessive speed and alcohol consumption. High speed was more common with more powerful machines. Negotiating outside bends seemed particularly hazardous. However, the errors of other road users were the most significant individual cause of fatal accidents. All motorcycle drivers were male, with a peak age group of 17, and most accidents occurred in the summer, frequently in the late evening. Some measures to reduce this mortality are discussed.

Whittington, RM (HM Coroner's Court) *Injury* Vol. 12 No. 4, HS-032 335, Jan. 1981, pp 267-273, 15 Tab., 1 Ref.

Acknowledgment National Highway Traffic Safety Administration
Order From Wright (John) and Sons Limited, 42-44 Triangle West, Bristol BS8 1EX, England

349857

MOTORCYCLE SURVEYS--HEADLIGHTS, HELMETS, AND ENGINE CAPACITY CHECKS

Two motorcycle surveys have been conducted in 1979, one in summer-time, the other in winter-time. In both surveys daytime headlight use was checked and in the latter survey type of helmet and c.c. rating of the motorcycles were also checked. The headlight use in the two surveys was different. In urban areas in the summer-time check there was 17% usage, but in the winter-time check there was 45% usage. The "full-face" type helmet was the most commonly worn helmet, which contrasts favourably with a 1973 survey which showed only around 12% wearing this type. Motorcycles with engine capacity greater than 250 c.c. were the most frequently checked (51.5%) which is considerably different to the percentages of registrations. Interactions between these factors were found, including helmet use and headlight use eg. riders turning headlight on were more likely to be wearing full-face helmets. This suggests a "safety consciousness" effect is operating. Riders of higher powered motorcycles were more likely to be wearing full-face helmets and using their headlights, while riders of low powered motorcycles were more likely to be wearing "Jet" helmets and not have their lights on.

Thomson, GA
Ministry of Transport, New Zealand Traffic Res Rpt. 23, HS-032 336, 1980, 21p, 7 Fig., 5 Tab., 14 Ref.

Acknowledgment National Highway Traffic Safety Administration
Order From Ministry of Transport, New Zealand, Road Transport Division, Private Bag, Wellington, New Zealand

349858

1980 NORTH DAKOTA VEHICULAR ACCIDENT FACTS

This annual publication presents statistical data concerning motor vehicle traffic accidents for all street and highway systems within North Dakota. This information is derived from reports submitted by police agencies on all motor vehicle accidents resulting in death, personal injury or property damage of $400 or more during 1980. Crash data is presented to represent the circumstances of motor vehicle crashes and identify substantive problem areas, so that appropriate countermeasures can be implemented.

North Dakota State Highway Department HS-032 340, 1980, 27p

Acknowledgment National Highway Traffic Safety Administration
Order From North Dakota State Highway Department, Transportation Services Division, Bismarck, North Dakota, 58505

349859

OFF-ROAD VEHICLE DYNAMICS

Recent developments in off-road vehicle dynamics are reviewed. Progress on this topic and the application of new techniques to the particular problems associated with off-road operation tend to lag behind practices established for road vehicles. The factor which limits further progress is the lack of appropriate off-road tyre data, in particular, on vibrational and lateral force generation characteristics. Also, a long term study should be aimed at understanding the dynamic behaviour of tyres on yielding surfaces.

Crolla, DA (Leeds University, England) *Vehicle System Dynamics* Vol. 10 No. 4-5, HS-032 342, Sept. 1981, pp 253-266, 63 Ref.

Acknowledgment National Highway Traffic Safety Administration
Order From Swets en Zeitlinger BV, Heereweg 347B, 2161 CA Lisse, Netherlands

349860

A PRELIMINARY STUDY OF ROAD-USER BEHAVIOUR IN DEVELOPING COUNTRIES

Road-user behaviour was studied at traffic signals, uncontrolled pedestrian crossings and priority junctions in a number of cities in developing countries. A comparison with similar observations made in Great Britain indicated that drivers were more likely to continue past red traffic signals and that they were less prepared to stop for pedestrians on crossings in the Third World cities than they were in Great Britain. Fewer pedestrians chose to use the crossings in these cities and, on average, they took longer to cross, partly because they were delayed whilst crossing whereas such delays rarely occurred in Great Britain. It is not known whether these differences in behaviour have led to more accidents but, because these differences exist, it is not possible to assume that the effect of introducing a remedial measure aimed specifically at changing or modifying road user behaviour in a developing country would be the same as in Great Britain.

Jacobs, GD Sayer, IA Downing, AJ
Transport and Road Research Laboratory SR 646, HS-032 344, 1981, 17p, 3 Fig., 5 Tab., 11 Ref.

Acknowledgment National Highway Traffic Safety Administration
Order From TRRL

349861

REDUCTION OF COMBUSTION NOISE AND STRUCTURAL IMPROVEMENT OF ITS TRANSMISSION PATH IN DIESEL ENGINE DESIGN

In order to provide a quieter diesel engine as an essential component of low-noise trucks, a two-year investigation of combustion noise and engine structural analysis was carried out. Influences of various variables related to combustion noise were observed on a Vee type two-cylinder engine, and the variables which seemed to be effective for noise control were confirmed on a multi-cylinder engine. Structural analysis was advanced by using improved measuring techniques such as applications of laser holography, transfer function and F.F.T. Furthermore, the adoption of accelerated running simulation on an eddy-current dynamometer made noise evaluation possible in an engine operating condition that was close to the actual vehicular situation. The target figure of engine noise reduction, 2 to 4 dB(A), could be almost achieved by cylinder block structural modification and turbocharging or by increasing the compression ratio for N.A. engines. Engine noise control techniques so far found effective and their problems are also discussed at the end of the paper.

Watanabe, Y (Nissan Diesel Motor Company Limited) *International Journal of Vehicle Design* Vol. 2 No. 3, HS-032 346, Aug. 1981, pp 276-288, 17 Fig., 2 Tab., 3 Ref.

Acknowledgment National Highway Traffic Safety Administration
Order From Inderscience Enterprises Limited, La Motte Chambers, St Helier, Jersey, England

349862

SCRAPPAGE AND SURVIVAL RATES OF PASSENGER CARS AND LIGHT TRUCKS IN THE U.S., 1966-77

In recent years sales of light trucks have increased dramatically raising their market share of new light duty vehicle sales from 12% in 1967 to 24% in 1978. Because light trucks are typically less fuel efficient than automobiles and because they have longer lifetimes, there is concern about the long run impact of this trend on the fuel efficiency of the light duty vehicle population. This paper investigates the scrappage patterns of imported and domestic automobiles and light duty trucks over the period 1966-77. Estimated scrappage functions for the three vehicle types differ significantly, the most striking difference being the longer lifetimes of light trucks as compared to passenger cars (median lifetimes were 14.5 and 9.9 years respectively). A comparison of pre and post 1973 time periods does not alter this conclusion. The long run effect of this is likely to be a vehicle population share about 5 percentage points higher than the light truck market share of new vehicles and a 3% reduction in overall fleet fuel economy.

Greene, DL (Oak Ridge National Laboratory) Chen, CKE (Tennessee University, Knoxville) *Transportation Research, Part A: General* Vol. 15A No. 5, HS-032 354, Oct. 1981, pp 383-389, 3 Fig., 4 Tab., Refs., 1 App.

Acknowledgment National Highway Traffic Safety Administration
Order From Pergamon Press Limited, Headington Hill Hall, Oxford OX3 0BW, England

349863

BEATING THE HIGH COST OF POOR DRUM BRAKE MAINTENANCE

This article evaluates school bus drum brake performance and service life. The use of original equipment, quality replacement parts, the replacement of all parts that should be replaced, and proper training of mechanics, coupled with a well thought-out overall maintenance program that includes regularly scheduled inspections, will result in extended service from hydraulic drum brakes, while reducing maintenance and repair costs.

Kourik, JW *School Bus Fleet* Vol. 26 No. 3, HS-032 324, June 1981, p 33

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: Bobit Publishing Company, 2500 Artesia Boulevard, Redondo Beach, California, 90278

349864

AUTOMOBILE INVENTIONS THAT "DIDN'T QUITE MAKE IT"

This tongue-in-cheek article describes several impractical inventions for automobiles which have been developed over the years, including methods for tipping a car on end to reduce parking space requirements, an in-vehicle keyboard organ, an auto that would safely roll end-for end, an in-vehicle cooking stove, and a pedestrian protector for vehicle-person accidents. It also notes some inventions that were originally rejected but later adopted for use in the automotive industry.

Bauman, R *California Highway Patrolman* Vol. 45 No. 3, HS-032 321, May 1981, p 12, 4 Phot.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: California Association of Highway Patrolmen, P.O. Box 2631, Sacramento, California, 95812

349865

FORMULA FOR THE '80'S: NEW METHODS, NEW PRODUCTS

This annual publication is a compilation of national and international motor vehicle data. This issue addresses the dramatic changes in methods and new products being introduced into the U.S. automobile industry in an attempt to improve its overall position in world motor vehicle production and sales. A short overview discusses the increasing industry use of computers to assist in design and engineering, to control production line robots, and to monitor the operation of the individual automotive unit. Seventy three (73) pages of data and charts evaluate Production and Registrations, Use and Owners, and Economic Impact of passenger cars, motor trucks and motor buses through 1980. This information is so grouped and highlighted in presentation, that a careful reading and analysis of the data and charts will help focus on historical patterns and future trends--both of which are significant in the understanding of the changes the motor vehicle industry is experiencing. The publication is indexed.

MVMA Motor Vehicle Facts & Figures '81 HS-032 326, 1981, 81p

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: Motor Vehicle Manufacturers Assn of the U.S., Inc, 300 New Center Building, Detroit, Michigan, 48202

349866

ROAD ACCIDENTS GREAT BRITAIN 1979

This very detailed statistical report is divided into four main sections: (1) Trends 1969-1979: (a) accidents; (b) accident rates; (c) casualties; (d) drivers involved in accidents; (e) casualty rates; (f) vehicles involved; and (g) vehicle involvement rates; (2) Detailed tables 1979: (a) accidents; (b) casualties; and (c) drivers and vehicles involved in accidents; (3) England, Wales and Scotland comparisons; and (4) International comparisons: road accidents 1978.

Department of Transport, England HS-032 350, 1981, 72p, 51 Tab.
Published in cooperation with the Scottish Development Department and the Welsh Office.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: Department of Transport, England, Statistics Transport and General Division, 2 Marsham Street, London SW1P 3EB, England

349867

THE GREAT MATERIALS SHOOT-OUT

The aim of this exercise was to design a trunk lid that would combine maximum weight savings at the lowest possible cost using the finite element analysis method. The criteria: The lid must look and work the same as the Omega 1980 lid. Reinforcing section depths could not exceed those used in the Omega lid. Five tests checked strength and stiffness, structural beaming, corner stiffness, hinge mounting pad stiffness, torsional rigidity and dent resistance. The materials were metals/steel, metal/aluminum, and plastics/sheet molding compounds. This multi-material competition showed steel had the resources to win many of the lightweight battles and came out the clear-cut winner in terms of costs.

McCann, MK *Automotive Industries* Vol. 161 No. 9, HS-032 325, Sept 1981, pp 60-66, 3 Phot.
Held at the Society of Automotive Engineers' 1981 Passenger Car Meeting, Dearborn, Michigan.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: Chilton Company, Chilton Way, Radnor, Pennsylvania, 19089

349868

1980 TRAFFIC ACCIDENT FACTS

This report analyzes accidents and fatalities in Florida by month, time of day, day of week, and counties in which they occurred. The contributing causes, estimated property damage, and economic losses are statistically diagrammed. Conditions of drivers and pedestrians statewide are also included as is the Annual Standard Summary.

Department of Highway Safety and Motor Vehicles HS-032 360, 1980, 31p

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: Department of Highway Safety and Motor Vehicles, Neil Kirkman Building, 2900 Apalachee Parkway, Tallahassee, Florida, 32301

349869

MOTOR VEHICLE STATISTICS OF JAPAN 1981

The contents of this statistical report are divided into six sections: (A) Motor Vehicles in Use; (B) New Registrations; (C) Production; (D) Imports; (E) Exports; and (F) Motorcycles and Motor Scooters. The period covered is from 1956 to 1980.

Japan Automobile Manufacturers Association, Inc HS-032 333, 1981, 32p

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: Japan Automobile Manufacturers Association, Inc, 1050 17th Street, NW, Washington, D.C., 20036

349870

1980 IOWA ACCIDENT FACTS

The information included in this report was taken from report forms provided by investigating officers and drivers involved in accidents. The information is presented in tabular form and includes a summary of Iowa and National trends (1969-1980); Vehicle miles/fatalities (1969-1980; Time: fatal/all accidents; Drivers/fatalities: age/sex; Drinking and driving; Holiday fatalities (1962-1980); Pedestrians; and Counties. Vehicles involved in accidents by type: Automobiles, buses, cycles, farm vehicles, motor homes, recreational vehicles, trains and trucks. There is also a sample of the Investigating Officer's Report.

Iowa Department of Transportation HS-032 339, Aug. 1981, 56p

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: Iowa Department of Transportation, Office of Safety Programs, Lucas Building, Des Moines, Iowa, 50319

349871

SUMMARY OF MOTOR VEHICLE ACCIDENTS BY COUNTY, MUNICIPALITY AND ROAD SYSTEM 1980

The statistical information provided in this report is based on data supplied by police agency reports of accidents submitted in accordance with the provisions of Title 39 of the State of New Jersey. The number of fatalities reported include fatalities that occurred within twelve months of the accidents until April 30, 1981. It includes accident severity (automobiles and pedestrians), time, light conditions, location and type (single vehicle or two or more vehicles).

New Jersey Department of Transportation HS-032 356, 1980, v.p.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: New Jersey Department of Transportation, 1035 Parkway Avenue, Trenton, New Jersey, 08625

349872

PARKING AND TRAFFIC ENFORCEMENT

This Information Bulletin reflects the concern of the Transportation Task Force of the Urban Consortium regarding the enforcement of parking and traffic laws and regulations in U.S. cities and urban counties. The bulletin also addresses the issue of decriminalization of parking and traffic infractions. A list of contacts and current programs and an annotated bibliography are included.

Public Technology, Incorporated, Department of Transportation HS-032 343, Sept. 1980, 22p, 2 Tab.

A Report of the Task Force of the Urban Consortium for Technology Initiatives.

Acknowledgment: National Highway Traffic Safety Administration
Order From: GPO

349873

NIGHT RIDING TRADEOFFS

A brief review is made of what a motorcyclist encounters during night riding. One of the major considerations is driver vision, including the problems of on-coming headlights and eye sensitivity, the relaxation of eye muscles when alcohol has been consumed, and slow glare recovery of riders who smoke due to eye photochemical reaction slowdown from lack of oxygen.

Driver Vol. 15 No. 4, HS-032 338, Sept. 1981, pp 18-20, 9 Phot.

Acknowledgment: National Highway Traffic Safety Administration
Order From: GPO

349874

MUNICIPAL TRAFFIC SAFETY: CHALLENGES AND OPPORTUNITIES

The Washington-Baltimore Section of the Institute of Transportation Engineers, through its Technical Affairs Committee, assumed the task of identifying those technical, institutional and procedural measures that might improve traffic safety studies in Maryland. To accomplish this task, the Section Technical Affairs chairman appointed a committee which, in cooperation with the faculty at the University of Maryland Transportation Studies Center and the Maryland Municipal League, proposed a seminar format. The seminar would bring together for one day traffic engineers and municipal and elected officials to answer the following questions: (1) What are the most pressing problems in small towns? (2) What are the most effective traffic engineering countermeasures? (3) How can traffic engineers and elected officials join forces to get these countermeasures in place and in operation? It is hoped that this report of the committee's activities and conclusions will be of use to other traffic engineers and may serve as a model for similar projects in other districts and sections.

ITE Journal Vol. 51 No. 9, HS-032 337, Sept. 1981, pp 34-38

Acknowledgment: National Highway Traffic Safety Administration
Order From: Institute of Transportation Engineers, 525 School Street, SW, Suite 410, Washington, D.C., 20024

349875

MOTOR VEHICLES. DRIVING WHILE INTOXICATED. SECTION 4511.19. IMPLIED CONSENT

To encourage people arrested for driving while intoxicated to submit to breathalyzer tests every state, plus the District of Columbia, now has an implied consent statute. These statutes are considered reasonable regulations capable of state enforcement under its police power to protect public safety. To avoid any coercion in eliciting consent, the statutes generally provide that upon refusal the test shall not be given but that the police officer shall file a sworn statement to the Registrar including the reasonable grounds on which he based his belief that the person was driving while intoxicated, that the alleged violator had been advised of the consequences of refusal and that he refused. This article examines various court cases in both the State courts and the United States Supreme Court where these implied consent statutes have been challenged.

Bruggeman, A *Akron Law Review* Vol. 13 No. 4, HS-032 334, 1980, pp 731-744

The case of Aurora v. Kepley, 60 Ohio St. 2d 73, 397 N.E. 2d 400 (1979).

Acknowledgment: National Highway Traffic Safety Administration
Order From: Rohrich Corporation, 903 Tallmadge Avenue, Akron, Ohio, 44310

349876

THE ROLE OF ACCIDENT INVESTIGATION IN ROAD SAFETY

A road accident is a rare, random, multifactor event to which it is usually impossible to assign a single cause. In recent years a systematic approach to Accident Investigation has been adopted by many local authorities in the United Kingdom. A description of such an approach is based on the author's experience in the Accident Investigation Unit in Nottinghamshire. In the early stages of Accident Investigation, location in space and time makes it possible to identify accident clusters at specific sites or particular problem areas and to detect diurnal or seasonal variations within this distribution. More detailed investigation identifies a multiplicity of factors which may or may not have contributed to the accident. Frequently recurring factors may point to a predominant accident type or pattern at a particular site. A multidisciplinary approach to the second-level in-depth investigation is needed in order to identify important environmental and behavioural factors. From this information it is often possible to determine countermeasures which are both appropriate and cost effective in terms of accident savings.

England, L (Nottinghamshire County Council) *Ergonomics* Vol. 24 No. 6, HS-032 351, June 1981, pp 409-422, 7 Fig., Refs.

Presented at International Conference on Road Safety, University of Wales Institute of Science and Technology, UWIST, Cardiff, UK, 7-11 September 1981.

Acknowledgment: National Highway Traffic Safety Administration
Order From: Taylor and Francis Limited, 4 John Street, London WC1N 2ET, England

349877

A SYSTEMATIC STUDY OF DRIVER STEERING BEHAVIOUR

A sequence of driving tasks has been carried out in a driving simulator. The initial tests represented lane tracking along a serpentine roadway and were employed to verify the operation of the simulator and the ability of a computer algorithm to fit linear driver models to experimental data. A second series of tests involved an obstacle avoidance manoeuvre in both a car and a truck. These latter simulator runs were augmented by field trials in an automobile during which driver eye point-of-regard data were recorded. Eye point-of-regard results from both simulator and field trials were compared and employed in formulating a simple driver model for the obstacle avoidance manoeuvre. The results from a preliminary fitting of this model to the experimental data are reported. It was found that a single linear model of the driver's dynamic characteristics can be used to represent adequately all of the driver response data measured in the present study.

Reid, LD Solowka, EN (Toronto University, Canada) Billing, AM (Ontario Ministry of Transportation & Communic, Can) *Ergonomics* Vol. 24 No. 6, HS-032 359, June 1981, pp 447-462, 11 Fig., 4 Tab., Refs.

Presented at International Conference on Road Safety, University of Wales Institute of Science and Technology, UWIST, Cardiff, UK, 7-11 September 1981.

Acknowledgment: National Highway Traffic Safety Administration
Order From: Taylor and Francis Limited, 4 John Street, London WC1N 2ET, England

349878

SAFETY AND REGULATIONS RESTRICTING THE HOURS OF DRIVING OF GOODS VEHICLE DRIVERS

The enhancement of safety is an explicit reason for regulations restricting hours of driving and work of heavy goods vehicle drivers; however the effectiveness of such regulations has been questioned. In some cases the regulations cannot be effective because they are neither enforced nor adhered to. Recent evidence suggests that both long hours of work and driving at night may be associated with an increased risk of accident; and a small part of recent improvements in the heavy goods vehicle accident rate may be due to regulations governing, amongst other things, drivers' hours. However, some drivers may be increasingly at risk because of high mileages and driving at night.

McDonald, N (Trinity College, Ireland) *Ergonomics* Vol. 24 No. 6, HS-032 352, June 1981, pp 475-485, 3 Fig., Refs.

Presented at International Conference on Road Safety, University of Wales Institute of Science and Technology, UWIST, Cardiff, UK, 7-11 September 1981.

Acknowledgment: National Highway Traffic Safety Administration
Order From: Taylor and Francis Limited, 4 John Street, London WC1N 2ET, England

349879

A SURVEY OF PARENTS' OPINIONS ABOUT CHILDREN'S TRAFFIC PARTICIPATION AND TRAFFIC EDUCATION

The traffic education of children does not start until the children are about 6 or 7 years old and start attending the primary school. The introduction of the child to the traffic environment is therefore a matter for the parents. Since the parents are made responsible for traffic education, their opinions about the traffic participation of their child and their educational efforts will to a large extent determine the children's exposure to traffic and their knowledge and ability to cope. The present study investigated the parents opinions' about the traffic participation of their children, their traffic educational efforts in terms of the methods and topics they emphasize, their opinions about traffic education and their opinion about other countermeasures. In addition, these data were related to measures of their children's traffic proficiency in order to detect factors which influence the effectiveness of the parents' educational efforts. The results indicate that children are exposed to traffic at a very early age, and that the intensity of the traffic to which they are exposed is relatively low. There are indications that two types of parents can be distinguished; one type appears to be control-oriented, rather repressive towards the child and general in the topics they emphasize. The other type seems more oriented towards educating on specific traffic topics, and are inclined to use practice as a method. However, both types rely on negative methods of education. Regression analysis demonstrates that parents have at least some effect on their child's traffic proficiency, but age and traffic exposure are also important factors. It is concluded that informing the parents about the specific problems children face in traffic may greatly improve their selection of relevant educational topics. Considering the probable relation between general child rearing practices and the methods used in traffic education, it might prove to be more difficult to adapt parents' methods of traffic education.

Rothengatter, T
Groningen University, Netherlands VK 80-06, HS-032 358, No Date, 32p, 14 Tab., Refs., 4 App.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: Groningen University, Netherlands, Traffic Research Centre, P.O. Box 14, 9750 AA Haren, Netherlands

349880

A SURVEY OF DRUG USE AMONG IMPAIRED DRIVERS IN VIRGINIA

There are approximately 33,000 breath and blood tests administered per year in Virginia for driving "under the influence." About 7200 of these are blood tests. Approximately ninety percent of the blood samples exceed 0.10% w/v alcohol, the level at which driving impairment is presumed by statute. Blood samples which had an alcohol content below 0.10% alcohol were analyzed for a variety of drugs with the following results: (a) Sixteen percent (approximately one out of six) of the blood samples were found to be positive for one or more drugs. (b) Eighty-four percent of the drug-positive samples also contained alcohol in concentrations ranging from 0.01 to 0.09% w/v. (c) The frequency of drug-positive samples increased with decreasing alcohol content. Samples containing no alcohol were drug-positive 30.3% of the time. Those containing 0.01 to 0.04% alcohol were drug-positive 25.2% of the time, and those containing 0.05 to 0.09% alcohol were drug-positive 12.3% of the time. (d) A total of 3.3% of all samples analyzed were found to contain two or more drugs, excluding drug metabolites and alcohol. (e) The most frequently detected drugs were diazepam and/or nordiazepam, methaqualone, phenobarbital, chlordiazepoxide, and phencyclidine. (f) Quantitation of the drugs indicated that the median concentrations in blood were consistent with what is usually present following "therapeutic" use. Finally, it must be noted that a number of other popular drugs were not detectable using the available analytical procedures. These include marijuana, LSD, heroin, oxazepam, and therapeutic concentrations of tricyclic antidepressants and antihistamines. Consequently, the actual incidence of potentially impairing drugs is probably much higher than that reported here.

Valentour, JC McGee, MP Edwards, RP Goza, SW Wiecking, DK, Editor *Medico-Legal Bulletin* Vol. 29 No. 5, HS-032 357, Sept. 1980, pp 1-7, 2 Fig., 1 Tab., 7 Ref.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: Department of Health, Medical Examiner Division, 9 North 14th Street, Richmond, Virginia, 23219

349881

SOBERING REMEDIES

The effects of ethanol can be counteracted essentially in three ways: (1) By making the stomach empty more slowly. This retards the absorption of ethanol by the blood and the blood-ethanol concentrations are not as high. Consequently, the ethanol effect on the central nervous system will also be lessened. All kinds of food, especially carbohydrates, prove effective in this respect. (2) By directly influencing ethanol's effect without lowering blood-ethanol concentrations. Levodopa and, to a still lesser degree, ephedrine and aminophylline, may have some direct influence on ethanol's central effects. The frequent side-effects, especially nausea and vomiting, however, make these unsuitable as sobering remedies. (3) By promoting ethanol breakdown. Large doses of fructose administered intravenously are effective in this respect. Fructose is not usable, however, because of the mode of administration, the large amounts needed, and the potentially dangerous biochemical modifications. In conclusion, it appears that the best way of counteracting the influence of ethanol is to slow down absorption by means of a sugar-containing beverage or a substantial meal.

Brink, G van den Gier, JJ de (Utrecht State University, Netherlands)
Institute for Road Safety Research HS-032 355, 1981, 36p, Refs.

A literature study regarding the efficacy and applicability of various substances to counteract the effects of ethanol consumption.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: Institute for Road Safety Research, P.O. Box 71, Deernsstraat 1, 2119 Voorburg, Netherlands

349882

SAFETY BENEFITS OF PAVED SHOULDERS ON RURAL TWO-LANE HIGHWAYS

The safety benefits of paved shoulders on rural two-lane highways have been the subject of much controversy and considerable debate; however, recent studies have been in general agreement. Paved shoulders are an effective means of preventing accidents. Relationships between shoulder width and accident experience are examined. Optimum shoulder widths for two operating speeds and a range of traffic volumes are presented. Shoulder widening projects were found to be cost-effective on high volume and high-accident highway sections. Paved shoulders provide positive safety benefits to the motoring public.

Fambro, DB (Texas A&M University) *SAFE Journal* Vol. 11 No. 2, HS-032 353, 1981, pp 22-25, 1 Fig., 2 Tab., 17 Ref.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: SAFE Association, P.O. Box 631, Canoga Park, California, 91303

349883

RESPONSE TIMES TO LEFT AND RIGHT DIRECTIONAL SIGNS

In two experiments, choice response times to word and arrow signs were measured. Subjects were asked to respond to visual stimuli which presented right or left directional instructions. Both left-and right-handed subjects were tested. In each experiment, a different response mode (vocal and ballistic lateral movement) was used; they produced similar results. Choice response times were faster for arrow directions than for words. Permissive stimuli (DO) produced faster responses than did prohibitive (DO NOT). Response times to left stimuli did not differ from latencies to right stimuli. Subject's hand preference did not influence choice response times or accuracy of responses. Some conclusions about designing traffic signs to facilitate left-right directional decisions are drawn.

Whitaker, LA (Missouri University, St Louis) Stacey, S (Virginia Polytechnic Institute & State University) *Human Factors* Vol. 23 No. 4, HS-032 348, Aug. 1981, pp 447-452, 2 Tab., Refs.

Direct reprint requests to Leslie A. Whitaker, Department of Psychology, University of Missouri, St. Louis, Missouri, 63121.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: Missouri University, St Louis, Department of Psychology, St Louis, Missouri, 63121

349884

REGULATION OF TECHNOLOGICAL ACTIVITIES: A NEW APPROACH

Efforts to regulate technological activities have led to confusing and inconsistent government actions, delays in realizing the benefits from scientific advances, huge financial burdens, and doubtful protection. In the absence of a clear decision-making authority on technological issues, appeal from regulations is frequently sought in the courts. A new approach to regulation is proposed in which the tasks of investigating a technological activity and of making decisions are separated. The former would be carried out by an investigatory agency charged with and enabled to determine the negative aspects of the technological activity, the latter by politically appointed decision boards. The boards would consider the negative evidence presented by the investigatory agency and balance it against the benefits of the proposed activity.

Ramo, S *Science* Vol. 213 No. 4510, HS-032 347, Aug. 1981, pp 837-842, 5 Ref.

Acknowledgment National Highway Traffic Safety Administration
Order From American Association for Advancement of Science, 1515 Massachusetts Avenue, NW, Washington, D.C., 20005

349885

PROSPECTIVE EVALUATION OF VEHICLE SAFETY STANDARDS: THE CASE OF AUTOMATIC OCCUPANT RESTRAINTS FOR PASSENGER CARS

A major component of government policy to improve road safety in Canada is the regulation of new motor vehicle performance under the federal Motor Vehicle Safety Act. This paper will describe the process of evaluation necessary to identify the effectiveness of proposed regulations, and will illustrate the state of the art in Canada by examining the case of a proposed regulation to require automatic restraint devices for occupants of passenger automobiles. This particular regulation has been proposed by the U.S. government for some years, and is interesting for the possible magnitude of its impact and for the problems its evaluation has posed. Only the requirements of "effectiveness evaluation" (determining the effectiveness in improving safety) will be considered, ignoring the additional requirements of economic evaluation.

Lawson, JJ Welbourne, ER
Department of Transport, Canada HS-032 345, 1981, 32p, 9 Fig., 7 Tab., 18 Ref., 2 App.

Paper presented to the Joint National Meeting of the Canadian Operational Research Society, the Institute of Management Sciences and the Operations Research Society of America, Toronto, May 3-6, 1981.

Acknowledgment National Highway Traffic Safety Administration
Order From Department of Transport, Canada, Canadian Surface Transportation Administration, Ottawa, Ontario K1A 0N5, Canada

349886

ON MAKING LIFE AND DEATH DECISIONS

Recent research has provided us with methods by which an individual can make decisions that involve risk to his life in a way that is consistent with his total preferences and with his current risk environment. These methods may ethically be used only by the individual himself or by an agent designated by the individual. In the absence of such delegation, anyone who imposes a risk on another is guilty of assault if the risk is large enough. Just as society has found ways to distinguish a "pat on the back" from physical battery, so must it now determine what risk may be placed upon another without his consent. The research on hazardous decision making creates a framework for this exploration. The basic concept of this approach is that no one may impose on another a risk-of-death loss greater than a specified criterion value established by the experience of society. If anyone attempted to do so, he could be forbidden by injunction. The only way that an injunction could be avoided would be by showing evidence of insurance that would cover the damages to be paid by the imposer of the risk if the unfortunate outcome should occur. The methodological framework is used both to estimate the risk-of-death loss and the amount to be paid if death occurs, an amount that is likely to be much larger than present "economic" values of life. Evidence would be required both on the preferences of the individual-at-risk as revealed and corroborated by his behavior and on the magnitude of the risk as assessed by experts. Such a system is likely to require revisions in the present legal codes. It is to be expected that when a logically and ethically based risk system is functioning, there will be an increased interest in purchasing the consent of people to imposed risk. Problems of securing the consent of contiguous property owners, for example, could be handled by interlocking options. People will also be more likely to be informed of the risk implied by using products or services. Thus risk would become an explicit part of purchasing decisions. The joining of logic and ethics in these new procedures offers hope for a more effective and humane treatment of risk issues in society.

Howard, RA (Stanford University) Burke, FE, Discusser (Waterloo University, Canada) Schwing, RC, Editor Albers, WA, Jr, Editor
Plenum Press HS-032 341, 1980, pp 89-113, 4 Fig., 3 Tab.

From "Societal Risk Assessment. How Safe is Safe Enough?"

Acknowledgment National Highway Traffic Safety Administration
Order From Plenum Press, 227 West 17th Street, New York, New York, 10011

349887

MOTOR VEHICLE OCCUPANT INJURIES IN NONCRASH EVENTS

Data on injuries sustained by child occupants in motor vehicles occurring in noncrash events are generally unrecorded. This study was undertaken to ascertain the occurrence of medically confirmed injuries sustained by child occupants in motor vehicles as a result of noncrash events. Seventy-nine children were seen in the emergency room for evaluation of injuries that they incurred as occupants in motor vehicle incidents over a period of 18 months. The majority of injuries occurred in crash events. However, 18 (23%) were injured in noncrash events. These events included sudden stops, swerves, turns, and movement of an unrestrained child within the vehicle. The mechanism of injury was either ejection from the vehicle or impact with an interior area of the vehicle. In five of the 18 cases safety restraint use could not be established. Of the 13 cases in which information was obtained, no child was restrained. Although the injuries were predominately minor (Abbreviated Injury Scale (AIS) 1), two children sustained moderate injury (AIS 2), and one child sustained severe injury (AIS 3). These results need to be confirmed by a larger study and if confirmed, the additional hazard of injury from noncrash events should be incorporated into health education messages that currently place primary emphasis on the potential for injury in crash events.

Agran, PF *Pediatrics* Vol. 67 No. 6, HS-032 332, June 1981, pp 838-840, 2 Tab., 12 Ref.

Direct reprint requests to (P.F.A.) Department of Pediatrics University of California, Irvine, School of Medicine, Irvine, California, 92717.

Acknowledgment National Highway Traffic Safety Administration
Order From California University, Irvine, Department of Pediatrics, Irvine, California, 92717

349888

A METHOD FOR ALLOCATING STATE POLICE OFFICERS IN ILLINOIS

The model designed for the allocation of state police officers or highway patrolmen to rural areas is based on assignment of manpower to three functions: administration (overhead), handling calls for service, and patrolling as a deterrent to crime and to violations of traffic law. Administrative support represents those officers required for managing the operations including central office, line, and specialty functions. These officers normally do not patrol or perform policing actions. Their assignment to positions is a function of the executive. Assignment of manpower to answer calls for service is dependent upon the number of calls received in two categories: accidents and generalized complaints. Sufficient personnel must be available to handle most of the requests when they are received and to respond to these requests within a reasonable time. Finally, officers are also assigned to preventative patrol. For a state police organization; this number is dependent on the number of miles of highway that require patrol, the traffic on those highways, and the number of persons residing in rural areas. The allocations based on these three criteria are assigned to counties. In turn, these counties are aggregated into districts which represent the primary organizational structure. The use of various parameters gives management the flexibility of selecting different policing objectives and examining the distribution of manpower that satisifies these objectives. This model works either with a predetermined allotment of police or it can be used to project the number of officers required.

Raub, RA Sweat, GL
Illinois Department of Law Enforcement HS-032 329, June 1981, 34p, 1 Fig., Refs., 2 App.

Acknowledgment National Highway Traffic Safety Administration
Order From Illinois Department of Law Enforcement, Division of Administration, Springfield, Illinois, 62706

349889

MEASURING DRIVERS' GLARE SENSITIVITY: EVALUATION OF AN AUTOMATED TECHNIQUE

An automated glare sensitivity-testing procedure based on contrast discrimination under variable glare was examined in a partially hierarchal experiment with 13 male and 17 female subjects comprising three homogeneously aged groups of 10 subjects each (M age equals 17, 42.2, and 69 years). Analysis of variance indicated significant (p less than .01) differences between age groups and a small but significant (p less than .01) practice effect. Correlations between successive test scores varied from .92 to .80, and the difference between mean scores of the oldest and youngest groups closely approximated that found in an earlier, clinical study. The technique is considered sufficiently accurate for quantifying glare sensitivity and identifying individuals who possess elevated glare sensitivity. Issues to be addressed in the future development of minimum standards for night driving are enumerated.

Sturgis, SP Pulling, NH Vaillancourt, DR *Journal of Applied Psychology* Vol. 66 No. 1, HS-032 328, Feb. 1981, pp 97-101, 2 Fig., Refs.

Direct requests for reprints to Samuel P. Sturgis, Liberty Mutual Research Center, 71 Frankland Road, Hopkinton, Massachusetts, 01748.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: Liberty Mutual Research Center, 71 Frankland Road, Hopkinton, Massachusetts, 01748

349890

REVIEW OF LITERATURE AND REGULATIONS RELATING TO THORACIC IMPACT TOLERANCE AND INJURY CRITERIA

The technical and scientific literature dealing with thoracic injury, to or within the rib cage, from blunt loading is reviewed. The history of the development of associated Federal Motor Vehicle Safety Standards is reviewed from the aspect of its relationship to the history of development of the research information. Field case data from car-to-car and car-to-tree/-pole crashes has been examined and summarized. This study suggests that the laboratory research has not adequately covered the principal variables found to exist in actual injury cases. Specifically, more research attention should be given to the shape of the impactor, to the loading location and direction, and to injuries in the contusion and/or laceration family. Correspondingly, the accident investigation process needs to be more sensitive to occupant/vehicle-interior interaction variables so that laboratory research can be properly guided.

Hess, RL Weber, K Melvin, JW
Highway Safety Research Institute, Motor Vehicle Manufacturers Assn of the U.S., Inc Final Rpt. UM-HSRI-81-38, HS-032 349, July 1981, 281p, 131 Fig., 12 Tab., 52 Ref., 3 App.
Contract

MVMA Proj No. 4.37

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: Highway Safety Research Institute, Huron Parkway and Baxter Road, Ann Arbor, Michigan, 48109

349891

MANUAL OF LOW-COST ROADWAY SAFETY IMPROVEMENTS FOR RURAL HIGHWAYS

This report was initiated to develop a systematic, standardized procedure to identify, evaluate and rank hazardous roadway locations and recommend the most cost-effective, low-cost improvements to reduce accidents at these locations. The scope of this project was limited to the following conditions: (i) only roadways and shoulders are considered; and (ii) only improvements which could be implemented without significant changes in roadway alignment were considered. An extensive literature review and a survey of Canadian operating agencies were undertaken to determine what safety improvement programs and techniques were in use, and to obtain effectiveness information for various countermeasures. As a result of these activities, a four-phase methodology was developed, as follows: (1) Identification of Hazardous Locations; (2) Identification of Specific Problems at These Locations; (3) Countermeasure Analysis and Ranking of Improvement Priorities; and (4) Program Monitoring.

ADI Limited, Transport Canada Research and Development Centre TP 3075E, HS-032 327, May 1981, 145p, Figs., Tabs., 38 Ref., 7 App.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: Transport Canada Research and Development Centre, Road and Motor Vehicle Traffic Safety Branch, Ottawa, Ontario K1A 0N5, Canada

349916

CAR MASS AND LIKELIHOOD OF OCCUPANT FATALITY

The purpose of this work is to estimate the relationship between car mass and the likelihood that a car will have an occupant fatality. Car occupant fatalities in the 1978 Fatal Accident Reporting System (FARS) data were divided into those killed in two car crashes and those killed in non-two car crashes. The relationship between car mass and the relative likelihood of an occupant fatality in non-two car crashes was determined by examining the number of fatalities in cars of a given mass driven by drivers of a given age divided by an estimate of the number of registered cars of the same mass having owners of the same age. This involves assuming that owners and drivers are the same people--clearly an approximation. This and other assumptions were necessary because of data limitations. The relationship between car mass and the relative likelihood of a fatality in a two car crash was determined using the FARS data and the assumption that when cars of the same mass crash, the relative likelihood of an occupant fatality has the same relationship with mass as determined in the non-two car crash analysis. The overall relationship between car mass on likelihood of an occupant fatality was obtained by taking a weighted average of the non-two car and two car cases. Because occupancy rates depend on car mass, the analysis was performed for drivers only as well as all occupants. This study finds that the likelihood that a car has an occupant or driver fatality is related to the mass of the car. (Author)

Evans, L
General Motors Research Laboratories GMR-3974, Feb. 1982, 26p, Figs., Tabs., Refs.

349917

RISKY DRIVING RELATED TO DRIVER AND VEHICLE CHARACTERISTICS

This investigation was performed to determine relationships between driver and vehicle characteristics and risk taking in everyday driving, as measured by close following in freeway traffic. A total of 12,000 observations were made of headways (time intervals between successive vehicles) in high flow freely moving freeway traffic at two sites, one in Michigan, the other in Toronto, Canada. The headways were measured using a photographic technique which allowed vehicle and occupant characteristics to be recorded, including type of vehicle and sex and seat belt use. For the Michigan observations, the vehicle license number was recorded, from which additional information on the vehicle and owner (usually the driver) was obtained from state files, including the vehicle mass and model year and the owner's age, sex, and history of recorded accidents and traffic violations. Shorter headways, corresponding to higher risk, were found for drivers with prior accidents or violations, young drivers, male drivers, drivers with no passengers, and drivers who did not wear a seat belt. Vehicles associated with shorter headways included newer cars and cars of intermediate mass (1600-1900 kg). (Author)

Evans, L Wasielewski, P
General Motors Research Laboratories GMR-3897, Nov. 1981, 23p, Figs., Tabs., Refs.

361002

AN ANALYSIS OF FATALITIES IN HEAVY GOODS VEHICLE ACCIDENTS

Police reports of all the 740 fatal road accidents involving heavy goods vehicles which occurred in Great Britain in 1976 have been studied. Although loss of control is briefly considered the report concentrates mainly on the need to reduce the severity of injury of all road users involved in the accidents. It is estimated that 35 per cent of fatally injured occupants of hgvs might have lived if they had worn a lap and diagonal seat belt, the main benefit being prevention of ejection. A further 12 per cent might also have lived if, as well as wearing a seat belt, the cab roof and supports had been strong enough to prevent severe crushing during overturning. As regards road users other than hgv occupants, it is estimated that, provided seat belts were worn, front under-run guards would have been of benefit to 10 per cent of all occupants killed in cars and light goods vehicles in accidents involving haeavy goods vehicles and rearunder-run guards of benefit to an estimated 5 per cent of fatally injured occupants. Lightweight guards fitted to the sides of hgvs could possibly prevent fatal injuries to an estimated 15 per cent of the pedal cyclists, motorcyclists and pedestrians killed by the heavy goods vehicles, mainly by preventing them from being run over. This report is a final one on the project originally described in SR 586. (Author/TRRL)

Riley, BS Chinn, BP Bates, HJ
Transport and Road Research Laboratory, (0305-1293) Monograph NLR 1033, 1981, 18p, 7 Tab., 6 Phot., 9 Ref.

ACKNOWLEDGMENT TRRL (IRRD 260235)

361016

CONTINGENCY TABLE ANALYSIS FOR ROAD SAFETY STUDIES

These proceedings contain the following papers: Contingency Tables (Andersen, EB); Methods for the Analysis of Contingency Tables in Road Safety Research (Oppe, S); Statistical Tests on Poisson Variables for Road Safety Evaluation (Lassarre, S); A Data Reduction Method Based on Information Theory (Bui Guoc, T); Measuring Exposure (Bancroft, D and Riemersma, J); The Minimum Discrimination Information Analysis of Contingency Tables in Traffic Safety Studies (Gokhale, DV); Iterative Fitting Procedures for Minimum Discrimination Information Estimation in Contingency Table Analysis (Keegel, JC); Contab (Nolan, J); Three Statistical Treatments of Contingency Tables in Road Safety Studies (Lassarre, S); Minimum Discrimination Information with Log-Linear Models: A More Robust Analysis (Roland, HE); Preliminary Analysis of the National Crash Severity Study: Factors in Fatal Accidents (Partyka, S); The Severity of Analysis of Highway Commercial Vehicle Accidents Philipson, LL, Rashti, P and Fleischer, GA). (TRRL)

Fleischer, GA, Editor Andersen, EB Oppe, S Lassarre, S Bui Guoc, T Bancroft, D Riemersma, J Gokhale, DV Keegel, JC Nolan, J
Sijthoff & Noordhoff Monograph No. 42, 1981, 252p, Figs., Tabs., Refs.
Proceedings of the NATO Advanced Study Institute on Contingency Table Analysis for Road Safety Studies.

ACKNOWLEDGMENT TRRL (IRRD 260093)

361017

THE SCIENCE AND TECHNOLOGY OF ACCIDENT INVESTIGATION, APRIL 7-9, 1981

Among the papers presented were the following: Accident Investigation (Burgoyne, JH); The Scientific Investigation of Road Accidents (Rudram, DA); Metallurgical Techniques in Accident Investigation (Ryder, DA); The Investigation of Structural Failures in Steel Buildings, Cranes and Bridges (Burdekin, FM). (TRRL)

Burgoyne, JH Rudram, DA Ryder, DA Burdekin, FM
Manchester University, Institute of Science & Tech Monograph 1981, 101p, 4 Fig., 2 Tab., Refs.

ACKNOWLEDGMENT TRRL (IRRD 260095)

361026

DRIVERS OF HAZARDOUS CARGOES--LEGAL ASPECTS OF A MAXIMUM AGE AND INCREASED PHYSICAL REQUIREMENTS

Due to the increasing involvement of heavy duty trucks in fatal crashes, there has arisen a movement to correct the highway environment and the trucks themselves, along with proposals to upgrade the standards for drivers of these vehicles, including proposals concerning stricter age and physical requirements for initiation and renewal of drivers' licenses. The purpose of this paper is to review some of the legal arguments which may arise from these proposals. These three questions are addressed: (1) Can the state establish a maximum age beyond which it would not issue a driver's license? (2) Can applicants for commercial drivers' licenses, as part of a periodic physical examination program, be required to pass certain strength tests relating to their ability to physically operate commercial vehicles? (3) Can truck drivers be required to undergo physicals by certain physicians approved by the licensing authority rather than a physician of their own choosing?

Hricko, AR *Federation of Insurance Counsel Quarterly* Vol. 31 No. 2, HS-032 474, 1981, pp 126-134

ACKNOWLEDGMENT National Highway Traffic Safety Administration
ORDER FROM Federation of Insurance Counsel, 1205 Red Rambler Road, Jenkintown, Pennsylvania, 19046

361027

DRIVER TRAINING FOR YOUR DEPARTMENT?

The purpose of this article is to convince the police administrator that he should develop or participate in a police driver training program and to show him how to do this efficiently and economically. It points out that driver training can and does reduce accidents and that a trained police officer operates his vehicle with competence and skill. In considering costs, the cost of the training program is viewed in light of the accident costs incurred when a police driver has an accident. The discussion of what a police driver training program is like covers what should be taught and how it should be taught, such as developing skill by behind the wheel training and utilizing visual aids to supplement lectures. In conclusion it is stated that the aim of a driver training program is to get the police officer where he is going quickly and safely, otherwise any skill which the officer has to handle the myriad of situations on the street is being wasted.

Barron, JJ Aurilio, SL *FBI Law Enforcement Bulletin* Vol. 50 No. 10, HS-032 472, Oct. 1981, pp 1-6, 7 Phot.

ACKNOWLEDGMENT National Highway Traffic Safety Administration
ORDER FROM Federal Bureau of Investigation, 9th Street and Pennsylvania Avenue, NW, Washington, D.C., 20535

361028

HOW TO FIND A SAFE CAR

This article reviews the safety facts about cars, trying to dispel some of the myths that have grown up about car safety. It states that safety experts estimate that the shrinking size of the automobile could lead to an increase of 15,000 fatalities annually by 1990. It also points out the general lack of concern for safety, stating that although statistics show that seatbelts are the best crash protection you have, 89 percent of Americans don't buckle up. The problem of the drinking driver is highlighted, and a large part of the article is devoted to a discussion of the NHTSA crash tests and why safety doesn't sell. In conclusion, some safety guidelines for new-car purchasers are given, along with tips for motorists who want to make and keep their own cars safer.

Weiss, MJ *Washingtonian* Vol. 16 No. 9, HS-032 465, June 1981, p 186

ACKNOWLEDGMENT National Highway Traffic Safety Administration
ORDER FROM Washington Magazine Incorporated, 1828 L Street, NW, Suite 200, Washington, D.C., 20036

361029

DETROIT BETS ON ELECTRONICS TO STYMIE JAPAN

This article discusses the use of programmable controllers, robots, lasers, and microwave detectors in the manufacturing of automobiles in the United States. Brief mention is made of the possible future use of ultrasonic liquid-level gauges and gamma-ray systems.

Jurgen, RK, Senior Editor *IEEE Spectrum* Vol. 18 No. 7, HS-032 462, July 1981, pp 29-32, 2 Phto., 3 Refs.

ACKNOWLEDGMENT National Highway Traffic Safety Administration
ORDER FROM Institute of Electrical & Electronics Engrs, Inc, 445 Hoes Lane, Piscataway, New Jersey, 08854

361030

DESIGN AND COMPREHENSION OF BILINGUAL TRAFFIC SIGNS

In order to develop a better understanding of how bilingual traffic signs are perceived and processed by road users, a study was designed to objectively evaluate the current range of bilingual sign designs and make recommendations on appropriate message placement principles. The study consisted of three phases: review of current signing practices; literature review; and, development, conduct and analysis of laboratory testing of various bilingual signs. Based on available information, it was decided to use glance legibility as the objective measurement of sign performance. 256 subjects, equally divided into four language sub-groupings, were exposed to various combinations of 13 bilingual sign messages (65 signs in total). The major findings of this study were as follows: (1) Bilingual signs required more reading time than unilingual signs; (2) The dominant language should be located either at the "TOP" of a "TOP-BOTTOM" sign message configuration, or at the "LEFT" of a "LEFT-RIGHT" configuration; (3) Neither the "TOP-BOTTOM" nor the "LEFT-RIGHT" sign message configuration was found to be significantly better than the other; (4) Clear demarcation of the two languages (for example, by a line) significantly improved sign performance, particularly for unilingual subjects; and (5) Use of "pivot" words (a word common to both languages) resulted in poorer sign performance than corresponding fully-translated signs.

Lesage, PB

Transport Canada Research and Development Centre TP 3037, HS-032 459, Mar. 1981, 51p, 21 Fig., 17 Tab., 3 Ref.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: Transport Canada Research and Development Centre, Road and Motor Vehicle Traffic Safety Branch, Ottawa, Ontario K1A 0N5, Canada

361031

DESIGN AND EVALUATION OF A CRASH PREDICTION STRATEGY. REPORT 76

The purpose of this project was to create and validate a method of identifying homogeneous groups of high risk drivers. This approach was based on the premise that this strategy would be more effective in identifying high risk drivers prior to their accident involvement than would the point count system now in place. Also, if successful, it would permit the tailoring of driver improvement efforts to groups with similar driving problems. Starting with a 6-year driver record on a sample of over 250,000 licensed drivers, five risk groups were identified based on a 3-year driver record. For each of the five groups, a regression equation was derived to maximize the prediction of accident involvement in a future 3-year period. These equations were then cross validated on an independent sample which met the risk group definition. The drivers identified as being high risk using this approach were compared to the drivers identified as being high risk by three other methods: (1) A surrogate for California's negligent operator point count; (2) A regression equation developed on a similar data base using total accidents and total convictions as predictors applied to the total population; and (3) A regression equation identical to that described in method #2 which also includes age and sex as predictors. The drivers identified by the regression equations had the highest future accident expectancy (53 to 54 accidents per 100 drivers during a subsequent 3-year period) while the risk group approach identified drivers with an expectancy of 50 accidents per 100 drivers. The point count identified drivers with an expectancy of 45 accidents per 100 drivers. Recommendations included modifying the negligent operator point count to include total accidents and convictions, and weighting them in such a way as to maximize accuracy of prediction of subsequent accident involvement. They also included fully automating the new selection criteria and continuing to assess the selection procedure on an ongoing basis.

McConnell, EJ Hagen, RE Peck, RC
California State Department of Motor Vehicles CAL-DMV-RSS-80-76, HS-032 460, Oct. 1980, 77p, 4 Fig., 25 Tab., Refs., 4 App.
Grant

OTS-057802

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: NTIS
PB81-142671

361032

DETECTION OF LEADED-GASOLINE USAGE IN CATALYST-EQUIPPED VEHICLES: A GAMMA-RAY TRANSMISSION GAUGE FOR MEASURING CATALYTIC-CONVERTER LEAD CONTAMINATION

A gamma-ray transmission gauge has been developed for measuring the accumulation of lead inside the catalytic converters of vehicles operated on leaded gasoline. This nondestructive inspection system relates the amount of gamma radiation passing through the catalytic converter to the mass concentration of lead contained in the catalyst bed. Field studies have shown that vehicle usage of 200 L of leaded gasoline (0.34 g of Pb/L) can be detected at the 95% confidence level. Based on tests with one vehicle burning 1000 L of leaded gasoline, the accumulation rate of lead on the catalytic converter was relatively constant, accounting for 45% of the total lead consumed. Subsequent usage of unleaded gasoline resulted in no significant loss of lead from the catalytic converter.

Schneider, EW
General Motors Research Laboratories GMR-3535, HS-032 461, Jan. 1981, 18p, 6 Fig., 1 Tab.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: General Motors Research Laboratories, Twelve Mile and Mound Roads, Warren, Michigan, 48090

361033

DRIVER IMPROVEMENT SCHOOLS--AN EVALUATION OF TWO PROGRAMS

The effectiveness of two driver improvement schools currently used by the Motor Vehicles Division of the Oregon Department of Transportation was evaluated. The two courses studied were the National Traffic Safety Institute's Traffic Violator Workshop (NTSI) and the National Safety Council's Defensive Driving Course (DDC). Driving records of people assigned to these programs were tracked for a year and not only compared with each other but also with records of drivers with equivalent past driving records who were assigned to a no-contact Control group. Statistical analyses of the one-year follow-up of the driving records were of two sorts. First, NTSI, DDC, and Control groups were compared without regard to whether drivers assigned to the schools actually attended or completed the classes. This program comparison allows an evaluation of the mere presence of these programs as incentives for improved driving. (Also these are the only comparisons that are meaningful for interpreting the effectiveness of either school relative to the Control group.) These analyses revealed that those drivers assigned to the courses had better subsequent records during that year than the Control group (43% versus 38% drove without a citation for a moving violation or chargeable accident for the combined programs and the controls, respectively). The bulk of the combined program impact was accounted for by DDC (46% trouble-free drivers for DDC and 40% for NTSI). Another program comparison consisted of the average delaying effect of assignment to NTSI or DDC (relative to the no-contact controls) on the next conviction or chargeable accident. Considering only those drivers who were unable to drive one full year without a conviction or chargeable accident, the NTSI and DDC programs had nearly identical delaying effects relative to the Control group--136, 137, and 106 days for NTSI, DDC, and Controls, respectively. The second form of data analysis involved contrasting only those drivers who completed the courses. It included only the NTSI and DDC groups. Again the DDC group performed better (52% success versus 43%). It is possible that DDC's greater structure, films made specifically for the course, and more attractive work booklets contributed to higher attention and cooperation levels and more efficient use of classroom time.

Kaestner, N
Oregon State Motor Vehicles Division HS-032 467, Dec. 1980, 38p, 9 Tab., 3 App.
Prepared in cooperation with Oregon Traffic Safety Commission.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: Oregon State Motor Vehicles Division, Public Information Office, 1905 Lana Avenue, NE, Salem, Oregon, 97314

361034

DEVELOPMENT OF A SEARCH TASK FOR THE MEASUREMENT OF PERIPHERAL VISUAL ACUITY

Experimental evidence is discussed which indicates a relationship between peripheral visual acuity and search performance. It is suggested that use of this relationship can be made in assessing the relative extent of a person's peripheral visual field (visual lobe) for target detection when visually screening individuals for industrial inspection tasks. A card sorting task involving visual search was developed which was shown to be sensitive to subject difference in search speed (p less than 0.001). Speed of search correlated significantly with visual lobe area (r = -0.92, p less than 0.01). Subjects foveal acuities were not significantly related to search time. Test retest reliability for forms A and B of the card sorting task over a 1 week period was r = 0.81(p less than 0.001).

Bellamy, LJ (Birmingham University, England) Courtney, AJ (Hong Kong University, Hong Kong) *Ergonomics* Vol. 24 No. 7, HS-032 469, July 1981, pp 497-509, 2 Fig., 5 Tab., Refs.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: Taylor and Francis Limited, 4 John Street, London WC1N 2ET, England

361035

DRIVER SIMULATOR COMMUNICATION MODE FOR HEARING-IMPAIRED STUDENTS

The purpose of this study was to compare three methods that could be used to modify driver simulator films for hearing-impaired students. A modification using graphics indicating various driving commands with the use of some captioning proved to be the most effective of the methods studied.

Sendelbaugh, JW *American Annals of the Deaf* Vol. 125 No. 5, HS-032 470, Aug. 1980, pp 542-546, 1 Tab., Refs., 3 App.

Acknowledgment National Highway Traffic Safety Administration
Order From Convention of American Instructors of the Deaf, 5034 Wisconsin Avenue, NW, Washington, D.C., 20016

361036

DRIVERS' KNOWLEDGE OF SPEED LIMITS: AN ON-SITE STUDY

Before a driver can comply with a speed limit he must be informed what that speed limit is. The extent to which drivers did know what the speed limit was at four sites was investigated. Three of the sites were in 30 mile/h speed limit and one site was in a 40 mile/h limit. Overall, 74 per cent of drivers gave the correct limit when asked but 26 per cent were unable to do so. Drivers were rather more likely to cite the correct speed limit in the 40 mile/h area and the repeater signs may be responsible for this. Interviews showed that the drivers relied to a large extent on speed limit signs to inform them of the speed limit and relatively few drivers were aware of the significance of the presence or absence of street lighting. Speed measurements on "free-movers" showed that those who identified the limit correctly were rather more likely to comply with it.

Cameron, RA
Transport and Road Research Laboratory SR 608, HS-032 473, 1980, 23p, 2 Fig., 14 Tab., 7 Phot., 6 Ref.

Acknowledgment National Highway Traffic Safety Administration
Order From TRRL

361037

COMPUTER AIDED EXPERIMENTAL SYSTEM FOR VEHICLE DEVELOPMENT

In vehicle design and development, shortening developmental periods, improving efficiency, and improving vehicle quality have been important subjects in past years. With these objectives in mind, the Vehicle Design and Development Dept., Nissan Motor Co., has been utilizing computers for CAD/CAM, CAE (Computer Aided Experiments), SA (Structural Analysis), EIM (Engineering Information Management), etc., and has been obtaining good results. The present paper describes the purpose and manner of introducing CAE to the design and development process. It also outlines an on-line system for vehicle performance tests, noise and vibration analysis, heat resistance tests, brake and engine performance tests, exhaust emission analysis, etc., which is a hierarchical structure system incorporating three host computers and twenty seven mini-computers. Finally, the future use of the CAE system is discussed.

Yagi, T (Nissan Motor Company, Limited) *JSAE Review* No. 4, HS-032 441, Mar. 1981, pp 105-118, 23 Fig., 3 Tab., 5 Ref.

Acknowledgment National Highway Traffic Safety Administration
Order From Society of Automotive Engineers of Japan, Inc. 10-2 Goban-cho, Chiyoda-ku, Tokyo 102, Japan

361038

R.I.D.E. (REDUCE IMPAIRED DRIVING IN ETOBICOKE): A DRIVING-WHILE-IMPAIRED COUNTERMEASURE PROGRAMME. ONE-YEAR EVALUATION

The Reduce Impaired Driving in Etobicoke (R.I.D.E.) is a counter-measure programme that is being conducted in Etobicoke (police district 2), a borough of Metropolitan Toronto and one of five police districts. The programme is based on the concept of general deterrence and involves two components, enforcement (by means of random spot-checks and roadside breath-testing that is aimed at increasing subjective and objective probabilities of risk apprehension) and education. There are some positive indicators of success, notably in the reduction in number of impaired drivers on the road, increased risk perception for being caught while drinking and driving, and increased knowledge on drinking and driving in Etobicoke, in favour of the merit of the R.I.D.E. programme, although by no means conclusive evidence in support of a reduction in alcohol-related accidents and injuries or changes in B.A.L.s. The results of this evaluation suggest numerous changes for the improvement of a R.I.D.E.-type programme and recommendations for improvement are offered.

Vingilis, E Salutin, L Chan, G
Addiction Research Foundation HS-032 476, 1979, 115p, 22 Fig., 24 Tab., Refs., 4 App.

Acknowledgment National Highway Traffic Safety Administration
Order From Addiction Research Foundation, 33 Russell Street, Toronto, Ontario, Canada

361039

R.I.D.E. (REDUCE IMPAIRED DRIVING IN ETOBICOKE): A DRIVING-WHILE-IMPAIRED COUNTERMEASURE PROGRAMME. A FINAL 18-MONTH EVALUATION

The Reduced Impaired Driving in Etobicoke (R.I.D.E.) was a drinking-driving countermeasure programme, piloted in Etobicoke, a borough of Metropolitan Toronto and one of the five Toronto police districts (district 2). The programme was based on the concept of general deterrence and involved two components: (i) enforcement, by means of random spot-checks and road-side breath-testing that is aimed at increasing subjective and objective probabilities of risk apprehension, and (ii) public education, aimed at increasing public knowledge of drinking-driving. The present report is an addendum to the one-year report. The results of the present report are the following: (1.) During the year and one half operation, a total of 180,185 drivers were checked by R.I.D.E. In the final six months, 42,082 cars were stopped and 539 A.L.E.R.T. tests were given. Of the drivers tested, 248 (46%) passed, 163 (30%) were warned, 112 (20%) failed and 16 (3%) refused. (2.) Trend analyses for the "alcohol-related" accident and injury data and proportion of all accidents and injuries considered "alcohol-related" showed statistically non-significant changes for most police districts, although the direction of the changes were generally downward. Etobicoke, however, demonstrated a nearly significant downward trend for "alcohol-related" accidents and proportion of all accidents considered "alcohol-related". (3) "Alcohol-related" and proportion of total considered "alcohol-related" accident data for Ontario Provincial Police patrolled Etobicoke and Toronto highway strips generally showed significant increases for Etobicoke and Toronto for Thursday through Saturday but not for Sunday through Wednesday.

Vingilis, E Chung, L Adlaf, E
Addiction Research Foundation HS-032 477, 1980, 68p, 21 Fig., 23 Tab., Ref.

Acknowledgment National Highway Traffic Safety Administration
Order From Addiction Research Foundation, 33 Russell Street, Toronto, Ontario, Canada

361040

THE COSTS OF AUTOMOBILE EFFICIENCY: A COMPARISON OF CONVENTIONAL AND ALTERNATIVE ENGINE TECHNOLOGIES

This paper compares the costs of improving fuel efficiency using conventional and alternative automobile technologies. We first estimate the implied costs of improving automobile efficiency and other desirable attributes (such as quality and performance) using conventional or "Otto" technology. These estimates are then compared with preliminary estimates from the Jet Propulsion Laboratory for producing equivalent efficiency, performance, and quality levels using alternative engines such as the Brayton or Stirling.

Block, MK Nold, FC *Logistics and Transportation Review* Vol. 17 No. 1, HS-032 454, 1981, pp 71-88, 1 Fig., 4 Tab.

Acknowledgment National Highway Traffic Safety Administration
Order From British Columbia University, Canada, Faculty of Commerce, Vancouver V6T 1W5, British Columbia, Canada

361041

DEATHS OF TEENAGERS AS PASSENGERS IN MOTOR VEHICLES. PRELIMINARY REPORT

Teenagers far exceed all other ages in fatalities per capita both as drivers and as passengers in motor vehicles. Most studies of vehicle crashes involving teenagers focus on teenage drivers, despite the fact that the numbers of teenage deaths as passengers and as drivers are about equal. In 1978, 63 percent of all fatally injured teenage passengers sustained their injuries in vehicles driven by teenage drivers; 72 percent of the passengers fatally injured in vehicles driven by teenage drivers were teenagers. Half of the teenage passenger deaths occurred in nighttime crashes. Possible ways to reduce the crash deaths of teenagers are discussed. These include restricting the driving of teenagers; prohibiting teenage drivers from transporting teenage passengers; greater implementation of crash packaging technologies; cleaning up highway and roadside hazards, and laws requiring seat belt use by teenagers.

Williams, AF Karpf, RS
Insurance Institute for Highway Safety HS-032 457, Sept. 1981, 18p, 8 Fig., 12 Ref.

Acknowledgment: National Highway Traffic Safety Administration
Order From: Insurance Institute for Highway Safety, Watergate 600, Washington, D.C., 20037

361042

A DESCRIBING-FUNCTION APPROACH TO ANTISKID DESIGN

A describing-function approach is employed in the design of an antiskid braking system. This includes the specification of the dynamics of a braking vehicle, a proposed system employing a feedback compensator to provide antiskid behavior, and the determination of the design parameters by a describing-function analysis. A wide range of tire-roadway conditions was considered in the latter. The resulting design was implemented and evaluated in field tests. The observed antiskid braking performance was approximately that predicted from the design. Thus the describing-function approach, especially in view of its ease of application and the insights it provides, appears to be a useful one for the control aspect of antiskid design.

Fling, RT Fenton, RE *IEEE Transactions on Vehicular Technology* Vol. T-30 No. 3, HS-032 458, Aug. 1981, pp 134-144, 21 Fig., 5 Tab., 5 Ref., 1 App.

Acknowledgment: National Highway Traffic Safety Administration
Order From: Institute of Electrical & Electronics Engrs, Inc. 445 Hoes Lane, Piscataway, New Jersey, 08854

361043

DISPLAYS FOR AUTOMOTIVE INSTRUMENT PANELS: PRODUCTION AND RATING SYMBOLS

An experiment was conducted to produce pictographic symbols for identifying gauges and/or warning lights on instrument panels of motor vehicles. Students in a University of Michigan psychology class drew pictures to symbolize seven vehicle systems (brake, coolant, etc.), four properties of these systems (fluid level, temperature, pressure, filter), and 26 combinations (brake fluid level, coolant temperature, etc.). In a second experiment, the students rated the meaningfulness of 216 symbols proposed for 26 different display functions. The proposed symbols, assembled from several sources, included those the students had produced. The rating experiment identified promising candidates for further investigation.

Green, P *HSRI Research Review* Vol. 12 No. 1, HS-032 463, July 1981, 12p, 4 Fig., Refs.

Acknowledgment: National Highway Traffic Safety Administration
Order From: Highway Safety Research Institute, Huron Parkway and Baxter Road, Ann Arbor, Michigan, 48109

361044

CONVENTIONAL ROAD SAFETY

The California Department of Transportation developed a program to reduce fixed object accidents for non-freeways. The four types of fixed objects studied were guardrails at the ends of bridges, utility poles, traffic sign posts, and trees. A benefit cost analysis was made to determine the estimated cost effectiveness of the program. Costs are given in terms of the estimated improvement costs and average accident costs, and benefits in terms of the cost savings due to accident frequency reduction and accident severity reduction.

Rinde, EA Smith, RN (California Department of Transportation) *ITE Journal* Vol. 51 No. 10, HS-032 453, Oct. 1981, pp 29-34, 4 Fig., 6 Tab., 4 Ref.

Acknowledgment: National Highway Traffic Safety Administration
Order From: Institute of Transportation Engineers, 525 School Street, SW, Suite 410, Washington, D.C., 20024

361045

DYNAMIC TESTING OF RESTRAINT SYSTEMS AND TIE-DOWNS FOR USE WITH VEHICLE OCCUPANTS SEATED IN POWERED WHEELCHAIRS

Thirty sled tests of wheelchair tie-downs and restraint systems were conducted using Everest and Jennings power wheelchairs and a 50th percentile male dummy. Twenty-nine tests were for a sled velocity differential of 20 mph at 16 G's deceleration. One test was for 30 mph at 20 G's. For each test top and side view high speed cameras recorded the impact event at approximately 1000 frames/second and seat belt load cells recorded the belt tension time histories. For the 30 mph test (80M029) triaxial head and chest accelerometers were used to compute head and chest resultant acceleration. This report describes these thirty tests and the impact results.

Schneider, LW
Highway Safety Research Institute, Massachusetts Rehabilitation Commission Final Rpt. UM-HSRI-81-18, HS-032 478, Apr. 1981, 150p, 1 Fig., 1 Tab., Phots.
Contract

DRDA-80-1249-J1(R2)

Acknowledgment: National Highway Traffic Safety Administration
Order From: Highway Safety Research Institute, Huron Parkway and Baxter Road, Ann Arbor, Michigan, 48109

361059

THE ROLE OF HEALTH SERVICES IN THE PREVENTION OF ROAD TRAFFIC ACCIDENTS. REPORT OF A WHO TECHNICAL GROUP, LONDON, 19-21 FEBRUARY 1980

As part of the who programme on the prevention of road traffic accidents, several technical groups have examined areas of concern, particularly the following: epidemiology applied to road traffic accidents, statistical data, public health aspects of road traffic accidents, medical monitoring, restraint systems, education, alcohol and drugs. It was agreed to approach the subject by: (1) defining areas in which health authorities can make a contribution either because they are the only authorities with the expertise needed or because they can complement and strengthen the efforts of the other authorities; (2) outlining a frame of action to guide health authorities in organizing themselves as full partners in formulating and implementing policy on traffic safety; (3) suggesting a form of organization for local supportive services; (4) suggesting a form of organization for services for the prevention of road traffic accidents within health services in general. (TRRL)

World Health Organization Monograph NCIP/ADR 03, No Date, 16p, Refs.

Acknowledgment: TRRL (IRRD 260962)

361146

TWENTY-FIFTH STAPP CAR CRASH CONFERENCE

These proceedings contain twenty-six papers presented at the 25th Stapp Car Crash Conference. They are by outstanding authors in the field of transportation safety and accidental death and injury, and present the most current data available from research in this field of study as of the conference date, September 28-30, 1981. The papers are individually entered in the TRIS data base under TRIS accession numbers 361147 through 361172.

Society of Automotive Engineers, Incorporated Proceeding P-97, HS-032 392, 1981, 950p, Figs., Tabs., Refs., Apps.

Proceedings of the Twenty-fifth Stapp Car Crash Conference, September 28-30, 1981, Jack Tar Hotel, San Francisco, California.

Acknowledgment: National Highway Traffic Safety Administration
Order From: Society of Automotive Engineers, Incorporated, 400 Commonwealth Drive, Warrendale, Pennsylvania, 15096

361147

TWENTY-FIVE YEARS OF STAPP CAR CRASH CONFERENCES

A historical review is made covering twenty-six years during which there were twenty-four meetings for field demonstrations and presentation of scientific papers. Twenty volumes of Proceedings were produced, consecutively numbered from Fifth to Twenty-Fifth from 1961 through 1981. The First Meeting was at Holloman Air Force Base on 17 May, 1955 in response to a request by Don Blanchard of the Society of Automotive Engineers for a tour of facilities and Field Demonstrations by the Aeromedical Field Laboratory relating to automotive crash research, for the benefit of the newly organized SAE Committee on Motor Vehicle Seat Belts and invited guests. The evolution of the Stapp Car Crash Conferences in terms of organization and program development is traced. Contributions to automotive safety research resulting from the Car Crash Conferences are discussed.

Stapp, JP
Society of Automotive Engineers, Incorporated Conf Paper 811011, HS-032 393, 1981, pp 3-10, 1 Tab.

Proceedings of the Twenty-fifth Stapp Car Crash Conference, September 28-30, 1981, Jack Tar Hotel, San Francisco, California.

ACKNOWLEDGMENT National Highway Traffic Safety Administration
ORDER FROM Society of Automotive Engineers, Incorporated, 400 Commonwealth Drive, Warrendale, Pennsylvania, 15096

361148

SIMULATION OF HEAD/NECK IMPACT RESPONSES FOR HELMETED AND UNHELMETED MOTORCYCLISTS

The purpose of this study was to assess, by use of computer simulations, the effectiveness of motorcycle helmets in reducing head and neck injuries in motorcyclist impacts. The computer model used was the MVMA Two-Dimensional Crash Victim Simulator. The study investigated a wide variety of impact conditions in order to establish a broad overall view of the effectiveness of helmets. It was found that helmet use invariably reduces dynamic responses which have a role in producing head injury and, in addition, almost always reduces the severity of neck response as well. For no configuration or condition does the helmet greatly increase the likelihood of neck injury. Thus, these simulations of a wide spectrum of motorcyclist impacts provide further evidence that helmet use significantly reduces the likelihood and severity of both head and neck injuries.

Bowman, BM Schneider, LW (Highway Safety Research Institute) Rohr, PR (Insurance Institute for Highway Safety) Mohan, D (Indian Institute of Technology)
Society of Automotive Engineers, Incorporated Conf Paper 811029, HS-032 394, 1981, pp 13-68, 36 Fig., 2 Tab., 21 Ref.
Proceedings of the Twenty-fifth Stapp Car Crash Conference, September 28-30, 1981, Jack Tar Hotel, San Francisco, California.

ACKNOWLEDGMENT National Highway Traffic Safety Administration
ORDER FROM Society of Automotive Engineers, Incorporated, 400 Commonwealth Drive, Warrendale, Pennsylvania, 15096

361149

COMPARATIVE STUDIES OF NECK INJURIES OF CAR OCCUPANTS IN FRONTAL COLLISIONS IN THE UNITED STATES AND IN THE FEDERAL REPUBLIC OF GERMANY

Parallel and coordinated accident studies were conducted in the United States and in the Federal Republic of Germany to determine the extent, the level, and the comparability of neck injuries in automotive accidents as reported in the National Crash Severity Study (NCSS), and the Association of German Automobile Insurers (HUK-Verband) files. To determine the comparability of the two data sets, three primary evaluation criteria were used: 1) the distribution of overall injuries by AIS level by various occupant parameters, 2) the risk of occupant AIS injury vs. delta V, and 3) the distribution of neck injuries by AIS for restrained vs. unrestrained occupants. Frequencies and severities of neck injuries in car accidents were compared in parallel layouts between the two data sets in frontal, side and rear impact modes. In further breakdown the frontal impact file was separated into driver/passenger and male/female categories. Accident direction and intensity as well as occupant parameters were investigated for their effects on neck injury severity. Neck injury severity distributions and types of injuries were compared with and without head contact for belted and unbelted occupants. Vehicle body components responsible for neck injuries were identified. Special cases were selected from the accident files of both data sets to illustrate the effects of the dominant accident injury modes resulting from inertial and direct contact loads. Countermeasures to minimize neck injuries were hypothesized.

Langwieder, K (Association of German Automobile Insurers) Backaitis, SH Fan, W Partyka, S Ommaya, A (National Highway Traffic Safety Administration)
Society of Automotive Engineers, Incorporated Conf Paper 811030, HS-032 395, 1981, pp 71-127, 3 Fig., 19 Tab., 30 Ref.
Proceedings of the Twenty-fifth Stapp Car Crash Conference, September 28-30, 1981, Jack Tar Hotel, San Francisco, California.

ACKNOWLEDGMENT National Highway Traffic Safety Administration
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361150

FREQUENCY AND SIGNIFICANCE OF SEAT BELT INDUCED NECK INJURIES IN LATERAL COLLISIONS

It is well established that properly worn seat belts reduce the incidence of severe neck injuries in car accidents in general. However, for certain configurations of nearside lateral collisions this statement has not been substantiated beyond any doubt by the published field accident data. In order to further evaluate this question, the samples of two accident investigation programs, one from Switzerland and one from France, were combined and analysed accordingly. They contain a total of 810 wearers of three point belts, 98 of which are cases of lateral nearside impacts. In 10% (N equals 10) of this subset neck injuries of AIS greater than or equal to 1 were registered. 7 of those 10 cases were of a degree of AIS greater than or equal to 2 whereby [illegible] of them could directly be attributed to an immediate belt contact. The corresponding incidence of neck injuries in the rest of the sample (712 cases of frontal, farside impacts, rollovers etc. with 111 victims exhibiting a neck injury rated AIS greater than or equal to 1) is not significantly different.

Walz, FH (Zurich University, Switzerland) Niederer, PF (Swiss Federal Institute of Technology) Thomas, C Hartemann, F (Association Peugeot S.A.-Renault)
Society of Automotive Engineers, Incorporated Conf Paper 811031, HS-032 396, 1981, pp 131-146, 8 Tab., 9 Ref.
Proceedings of the Twenty-fifth Stapp Car Crash Conference, September 28-30, 1981, Jack Tar Hotel, San Francisco, California.

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361151

EXPERIMENTAL STUDIES OF BRAIN AND NECK INJURY

Static and dynamic axial tension loads were applied to the intact and isolated cervical column of the monkey and human cadaver. Radioactive microspheres were used to evaluate brain and spinal cord perfusion in the monkey. To determine neural pathway damage, somatosensory evoked potentials were recorded with stimulation of sensorimotor cortex, and in spinal cord with stimulation of cauda equina. The evoked potential amplitude decreased prior to heart rate and blood pressure changes presumably due to brainstem distention. The preliminary studies show, 1) the brain and spinal cord were well perfused as measured with the microspheres when the evoked potentials decreased, 2) the cervical isolated cadaveric monkey spinal column ligaments failed statically at approximately 1/2 to 1/3 the force required for dynamic disruption, 3) in the intact monkey, the cervical ligaments failed statically at approximately 1/2 the dynamic failure force, 4) the isolated human cervical ligaments failed at loads approximately three times those observed in the isolated monkey cervical column.

Sances, A, Jr (Marquette University) Myklebust, J Cusick, JF Weber, R Houterman, C Larson, SJ Walsh, P Chilbert, M Prieto, T Zyvoloski, M Ewing, C Thomas, D Saltzberg, B
Society of Automotive Engineers, Incorporated Conf Paper 811032, HS-032 397, 1981, pp 149-194, 20 Fig., 5 Tab., 31 Ref.
Proceedings of the Twenty-fifth Stapp Car Crash Conference, September 28-30, 1981, Jack Tar Hotel, San Francisco, California.

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361152

RESPONSE OF THE CERVICAL SPINE TO SUPERIOR-INFERIOR HEAD IMPACT

A test series using 12 unembalmed cadavers was conducted to investigate factors affecting the creation of cervical spine damage due to impact to the top of the head. The test subjects were instrumented to measure head, T8 thoracic spine, and sternum acceleration responses. Photographic targets on the head and torso allowed analysis of impact motions from high-speed movies. The stationary test subject was struck by a guided, moving impactor mass of 56 Kg at 4.6-5.6 m/s. The impactor striking surface consisted of a biaxial load cell with padding to vary the contact force-time characteristics of the head/impactor. The orientation of the head, cervical spine, and torso was adjusted relative to the impactor axis to investigate the effect of spinal configurations on the damage patterns. Load and acceleration data are presented as functions of time and as functions of frequency in the form of mechanical impedance. Damage to the cervical spine was produced in all but one test, including fractures of the spinous processes, laminae, transverse processes, and the bodies of the vertebrae as well as ruptured discs and torn ligaments. Both anterior and posterior damage was produced and the sites of the damage ranged from C2 to T4. The peak forces produced during the impacts ranged from 1.8 kN to 11.1 kN. The limited response data of this pilot study do not allow any specific conclusions with regard to cervical spine tolerance levels. However, it does attest to the influence of spinal configuration and impact conditions on both response and damage of the spine due to crown impact.

Nusholtz, GS Melvin, JW Huelke, DF Alem, NM Blank, JG (Highway Safety Research Institute)
Society of Automotive Engineers, Incorporated Conf Paper 811005, HS-032 398, 1981, pp 197-237, 17 Fig., 4 Tab., 15 Ref.
Proceedings of the Twenty-fifth Stapp Car Crash Conference, September 28-30, 1981, Jack Tar Hotel, San Francisco, California.

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361153

A STUDY OF IMPACTS TO THE LATERAL PROTECTED AND UNPROTECTED HEAD

In an earlier series of papers, we reported on the results of a study of frontal impacts to cadaver heads which were protected and unprotected. New data is presented to quantify head response to laterally directed impacts. The temporo-parietal area of the head in stationary unembalmed cadaver subjects was struck by a rigid impactor mass. Both helmeted and unhelmeted exposures were compared. Data collected included impactor energy, intracranial pressures at selected locations, and composite analyses from a nine accelerometer array system. In addition the data was entered into a finite element head model. Stresses and strains were predicted for various intracranial locations. The applicability of head injury indices in understanding lateral head impact are commented on.

Nahum, A Ward, C Schneider, D Raasch, F Adams, S (California University, San Diego)
Society of Automotive Engineers, Incorporated Conf Paper 811006, HS-032 399, 1981, pp 241-268, 14 Fig., 4 Tab., 10 Ref.
Proceedings of the Twenty-fifth Stapp Car Crash Conference, September 28-30, 1981, Jack Tar Hotel, San Francisco, California.

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361154

INFLUENCE OF ARM POSITION ON THORACIC INJURIES IN SIDE IMPACT

The thorax is frequently involved in side impact accidents; in such accidents, injuries to the thorax are related to the intrusion. The position of the impacted side arm can affect the occuring of thoracic injuries in side impact. This study describes the results of 15 side impact thoracic tests performed on 8 cadavers; most of these tests are conducted with arm involvement (the upper arm is placed along the thorax and the impact is transmitted to the thorax through the arm). The results of these tests are compared to the results of 6 tests previously published, conducted without arm involvement (the imapct was applied directly to the thorax). From these results, it appears that the arm offers a limited protection when it is placed along the thorax, by distributing impact forces on the chest, and that the BLUR criterion is not well correlated with the thoracic injuries severity.

Cesari, D Ramet, M Bloch, J (National Council for Road Safety)
Society of Automotive Engineers, Incorporated Conf Paper 811007, HS-032 400, 1981, pp 271-297, 10 Fig., 9 Tab., 10 Ref.
Proceedings of the Twenty-fifth Stapp Car Crash Conference, September 28-30, 1981, Jack Tar Hotel, San Francisco, California.

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361155

CORRELATION OF SIDE IMPACT DUMMY/CADAVER TESTS

This paper is part of a four year study to systematically define side impact injury in terms of the kinetic response of a suitable anthropomorphic dummy. Last year a paper was presented at the Experimental Safety Vehicle Conference in Germany which analyzed side impact dummy response and injury prediction based on cadaver data generated by the Highway Safety Research Institute. These subjects were generally older than those discussed in the current paper. This paper includes data from a number of University of Heidelberg cadaver sled tests--including padding tests which we recently found to be (1) critical for a definitive analysis and (2) previously not available. Two advanced dummies, whose design specifications are based upon biomechanical data, are currently being evaluated by the biomechanical community. The two dummies are (1) a Side Impact Dummy (SID) designed by the Highway Safety Research Institute (HSRI) and (2) the Association Peugeot-Renault (APR) dummy from France. The performance of these two candidate dummy designs is compared by a variety of techniques in seven identical tests using cadavers. These tests are chosen for use in evaluating biofidelity, repeatability, and dummy/padding interaction. Among these techniques is a cumulative variance analysis--similar to a root-mean-square analysis--of the acceleration signal for the seven unique sled/pendulum tests where acceleration response data exists for APR dummy, SID, and cadavers. This cumulative variance approach allows an objective comparison of the response of each dummy design with respect to the cadaver data.

Morgan, RM Marcus, JH Eppinger, RH (National Highway Traffic Safety Administration)
Society of Automotive Engineers, Incorporated Conf Paper 811008, HS-032 401, 1981, pp 301-326, 18 Fig., 4 Tab., 2 App.
Proceedings of the Twenty-fifth Stapp Car Crash Conference, September 28-30, 1981, Jack Tar Hotel, San Francisco, California.

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361156

QUANTIFICATION OF SIDE IMPACT RESPONSES AND INJURIES

Side impacts have been shown to produce a large portion of both serious and fatal injuries within the total automotive crash problem. These injuries are produced as a result of the rapid changes in velocity an automobile occupant's body experiences during a crash. Any improvement to the side impact problem will be brought about by means which will ultimately modify the occupant's rapid body motions to such a degree that they will no longer produce injuries of serious consequence. Accurate knowledge of both the body's motion and resulting injuries under a variety of impact conditions is needed to achieve this goal. Possession of this knowledge will then permit development of accurate anthropomorphic test devices and injury criteria which can be used to create effective injury countermeasures in vehicles.

Kallieris, D Mattern, R Schmidt, G (Heidelberg University, West Germany) Eppinger, RH (National Highway Traffic Safety Administration)
Society of Automotive Engineers, Incorporated Conf Paper 811009, HS-032 402, 1981, pp 329-366, 25 Fig., 7 Ref.
Proceedings of Twenty-fifth Stapp Car Crash Conference, September 28-30, 1981, Jack Tar Hotel, San Francisco, California.

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361157

THORACIC INJURY PREDICTION VIA DIGITAL CONVOLUTION THEORY

A dynamic characterization of the human thorax, in the form of a digital impulsive response signature, has been obtained which links the acceleration response of the struck side with the far side of the thorax under side impact conditions. This dynamic characterization was obtained by a unique combination of digital convolution theory, least squares approximation techniques, and a digital set of cadaver impact data. It has proven itself accurate in predicting the maximum relative acceleration, velocity and displacement between the left and the right lateral aspects of the thorax for a variety of impact conditions including lateral pendulum impacts, lateral rigid walls impacts at 15 and 20 mph and lateral impacts into padded walls at 20 mph. Detailed discussions of the theory, the derivation of the various thoracic response signatures and their correspondence with actual data, the utilization of these response functions to predict injury, and the application of this technique to identify promising safety systems design strategies is presented.

Eppinger, RH Chan, H-S (National Highway Traffic Safety Administration)
Society of Automotive Engineers, Incorporated Conf Paper 811010, HS-032 403, 1981, pp 369-393, 12 Fig., 3 Tab., 2 Ref.

Proceedings of the Twenty-fifth Stapp Car Crash Conference, September 28-30, 1981, Jack Tar Hotel, San Francisco, California.

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361158

THE DESIGN AND EXPERIMENTAL USE OF A CHEST LOAD-DISTRIBUTION TRANSDUCER AND FORCE-INDICATING LEGS FOR THE PART 572 DUMMY

The current Part 572 50th percentile male dummy's chest and legs only indirectly and incompletely measure the forces acting upon them-by spinal acceleration for the chest and by mid-femur axial force for the legs. A new chest and set of legs have been designed and are in experimental use in a Part 572 dummy which far more completely measure the forces acting upon them during crash testing. These two new test devices, a chest load-distribution transducer and a pair of force-indicating legs, have been developed as an aid to developing improved vehicle occupant restraint systems. The chest load-distribution transducer is a modification of a Part 572 50th percentile male dummy thorax to permit dynamic measurements of three components of restraint system loads applied to six key segments of the rib cage during restraint system testing. The force-indicating dummy legs are completely new from the foot to the thigh. These legs permit the measurement of most of the skeletal forces that are likely to be experienced by a dummy's legs during leg-to-instrument panel (or knee bolster) contact in dynamic restraint system testing. This paper discusses the development and implementation of both of these new test devices.

Daniel, RP Yost, CD (Ford Motor Company)
Society of Automotive Engineers, Incorporated Conf Paper 811012, HS-032 404, 1981, pp 397-432, 21 Fig., 12 Ref.

Proceedings of the Twenty-fifth Stapp Car Crash Conference, September 28-30, 1981, Jack Tar Hotel, San Francisco, California.

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361159

FIELD FACIAL INJURIES AND STUDY OF THEIR SIMULATION WITH DUMMY

With drivers wearing 3-point seat belts, the head-steering-wheel impact occurs in most serious accidents, so inducing mainly face injuries. In a first part, the authors analyze the injuries observed in a sample of 1180 belted drivers involved in frontal collisions, making a distinction, mainly for facial impacts, between injuries related to the properly so-called face and those to the skull and brain and the different possible lesional correlations. In the second part are presented the results of work carried out in order to define a human face model adaptable to any type of Hybrid II or Hybrid III dummies' heads. The use of this model allows one to elaborate a new protection criterion for the face, destination of which should be to complete the head and skull protection criterion, such as the HIC (or another equivalent criterion which could possibly replace it).

Tarriere, C Leung, YC Fayon, A (Association Peugeot S.A.-Renault) Got, C Patel, A (Hopital Raymond Poincare, France) Banzet, P (Hopital Saint-Louis, France)
Society of Automotive Engineers, Incorporated Conf Paper 811013, HS-032 405, 1981, pp 435-468, 10 Fig., 12 Tab., 8 Ref.

Proceedings of the Twenty-fifth Stapp Car Crash Conference, September 28-30, 1981, Jack Tar Hotel, San Francisco, California.

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361160

IMPACT FORCE-DEFLECTION OF THE HUMAN THORAX

A volunteer was impacted at velocities up to 4.6m/sec. (15 ft./sec.) with a 10 kg (22.1 lb.), 15.2 cm (6in.) diameter padded impactor. Force-time, deflection-time and force-deflection data are presented for these impacts showing a maximum force of 1.67 kn (376 lbs.) and a maximum skeletal deflection of 4.6 cm (1.80 in.). The maximum chest compression is about the same at 4.4 cm to 4.6 cm (1.72 to 1.80 in.) at all impact velocities. The force-deflection curve reaches a plateau where there is relatively little change in force for a large change in deflection after which there is a large change in force with little change in the maximum deflection. There is considerable hysteresis, and the force drops to zero while there is still appreciable skeletal deflection.

Patrick, LM (Libbey-Owens-Ford Company)
Society of Automotive Engineers, Incorporated Conf Paper 811014, HS-032 406, 1981, pp 471-496, 8 Fig., 6 Tab., 18 Ref.

Proceedings of the Twenty-fifth Stapp Car Crash Conference, September 28-30, 1981, Jack Tar Hotel, San Francisco, California.

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361161

CINEPHOTOGRAMMETRICAL STUDY OF PORCINE THORACIC RESPONSE TO BELT APPLIED LOAD IN FRONTAL IMPACT--COMPARISON BETWEEN LIVING AND DEAD SUBJECTS

The mechanical response and the injury pattern of pig thorax submitted to belt loading conditions were compared for living and dead subjects. The absolute deflexion and the resultant force were computed from cinephotogrammetric data. The results indicate that dead are stiffer by 80% than living subjects. The visceral injury rate is higher in the living population. The skeletal injury rate is identical for both populations but injury patterns are different. Correlations were obtained in the living sample particularly between injury levels and deflexion, force and aortic pressure. With dead subjects, only one correlation was obtained between injury level and deflexion.

Verriest, JP Chapon, A Trauchessec, R (National Council for Road Safety)
Society of Automotive Engineers, Incorporated Conf Paper 811015, HS-032 407, 1981, pp 499-545, 23 Fig., 6 Tab., 15 Ref., 3 App.

Proceedings of the Twenty-fifth Stapp Car Crash Conference, September 28-30, 1981, Jack Tar Hotel, San Francisco, California.

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361162

INTERRELATIONSHIP OF VELOCITY AND CHEST COMPRESSION IN BLUNT THORACIC IMPACT TO SWINE

As part of a continuing study of thoracic injury resulting from blunt frontal loading, the interrelationship of velocity and chest compression was investigated in a series of animal experiments. Anesthetized male swine were suspended in their natural posture and subjected to midsternal, ventrodorsad impact. Twelve animals were struck at a velocity of 14.5 plus or minus 0.9 m/s and experienced a controlled thoracic compression of either 15,19,or 24%. Six others were impacted at 9.7 plus or minus 1.3 m/s with a greater mean compression of 27%. For the 14.5 m/s exposures the severity of trauma increased with increasing compression, ranging from minor to fatal. Injuries included skeletal fractures, pulmonary contusions, and cardiovascular ruptures leading to tamponade and hemothorax. Serious cardiac arrhythmias also occurred, including one case of lethal ventricular fibrillation. The 9.7 m/s exposures produced mainly pulmonary contusion, ranging in severity from moderate to critical. Cardiac arrhythmias occurred but were typically minor. In contrast to the lower compression impacts at 14.5 m/s, there were no rib fractures or cardiovascular ruptures. In general, peak sternal acceleration and applied force correlated with impact velocity but not with normalized compression; and spinal acceleration did not correlate with any parameter. Overall, the high velocity exposures, produced higher mechanical responses, more severe gross trauma and more serious cardiac arrhythmias despite lower compression levels. The results of this study while reconfirming normalized compression as one correlate of injury, emphasize the importance of loading velocity in determining the overall severity of blunt thoracic impact.

Kroell, CK Pope, ME Viano, DC (General Motors Research Laboratories) Warner, CY (Brigham Young University) Allen, SD (Utah State University)
Society of Automotive Engineers, Incorporated Conf Paper 811016, HS-032 408, 1981, pp 549-579, 11 Fig., 5 Tab., 12 Ref.

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361163

TEST DUMMY INTERACTION WITH A SHOULDER OR LAP BELT

Belt interaction with the dummy's chest or pelvis was investigated during simulated frontal decelerations to develop a better understanding of the mechanics of belt restraint. Hyge sled tests were conducted at acceleration levels of 6-16 g's with a Part 572 dummy forward facing on an automotive bucket seat. Dynamics were compared in similar tests where the dummy was restrained by a conventional shoulder belt or belt segments attached to a modified sternum--a steel sternum with extensions for fixed belt attachments. Tests were also conducted with a conventional lap belt or belt segments fixed to an extension of the H point. Deformation characteristics of the standard and modified thorax were determined for a lateral and superior point load or a belt yoke compression of the sternum. The pelvic structure was also compressed by a lap belt.

Viano, DC   Culver, CC (General Motors Research Laboratories)
Society of Automotive Engineers, Incorporated   Conf Paper 811017, HS-032 409, 1981, pp 583-609, 13 Fig., 3 Tab.

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361164

BEHAVIOR AND RESPONSE OF WHEEL CHAIR, PASSENGER AND RESTRAINT SYSTEMS USED IN BUSES DURING IMPACT

Frontal, lateral and rear-end collisions with dummy occupied wheel chairs on a deceleration sled were conducted in two test series at a collision velocity of 30 km/h, and a sled deceleration of 8 and 12 g. In the first dummy test series conventional restraint systems were used; in the second test series improved restraint systems were employed. In a further series, four cadaver tests were conducted. For all tests and collision directions the HIC values, as well as the resultant acceleration at the center of gravity lay below the admissible values of Federal Motor Safety Standard 208. Despite the low thorax accelerations numerous rib fractures occurred in the cadaver tests. In two cadaver tests, injury degrees of AIS 5 were observed (multiple liver ruptures, vertebral column injuries).

Kallieris, D   Mattern, R   Schmidt, G (Heidelberg University, West Germany)   Glitsch, G-D   Harres, M   Leis, B
Society of Automotive Engineers, Incorporated   Conf Paper 811018, HS-032 410, 1981, pp 613-647, 5 Fig., 8 Tab., 6 Ref.

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361165

DEVELOPMENT OF A DUMMY ABDOMEN CAPABLE OF INJURY DETECTION IN SIDE IMPACTS

A prototype of an abdomen for injury detection in side impacts is developed. This design can in principle be built into existing side-impact dummies. Necessary biomechanical data was obtained from free-fall studies with cadavers simulating impacts with intruding doors. The design consists of a structure with built-in tolerance limits and injury detection is obtained by a single channel go/no-go signal; thus complicated continuous force and penetration measurements are avoided. The abdomen has a rigid penetration stop at the critical tolerance level. This stop is covered by a composite material giving stiffness characteristics identical to the human abdomen. Coded contact switches activated by springs when a critical load is exceeded are mounted between this material and the rigid stop. The abdomen is presented in detail together with the results of impact tests. The materials for the abdomen were selected with assistance of a computer aided design study described in this paper. The interfacing with some existing dummies and a possible extension to frontal abdomen injury detection is discussed.

Maltha, J (Research Institute for Road Vehicles, TNO, Nethlds)   Stalnaker, RL (Southwest Research Institute)
Society of Automotive Engineers, Incorporated   Conf Paper 811019, HS-032 411, 1981, pp 651-682, 17 Fig., 1 Tab., 12 Ref.

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361166

AN ANTI-SUBMARINING SCALE DETERMINED FROM THEORETICAL AND EXPERIMENTAL STUDIES USING THREE-DIMENSIONAL GEOMETRICAL DEFINITION OF THE LAP-BELT

A theoretical study was conducted to prove that the Part 572 dummy submarines more easily than human cadavers because of their different pelvic shapes. The three-dimensional geometrical definition of the lap-belt was developed in this paper for the study of the submarining problem. It was found that not only the lap-belt angles from side view (Beta 1) but also from the upper view in respect to the X-axis (Beta 2) play a significant role in the submarining tendency for each side. The anti-submarining scale is defined by a coefficient which is a function of both angles Beta 1, Beta 2 and the orientation of the upper half of the pelvic notch. A series of sled tests was performed on human cadavers, the Part 572 dummy and the modified dummy. Good agreement was found between the present theory and the experimental results. Some of the experimental results cannot be explained with the traditional geometry definition of the lap-belt given in two dimensions, but they are clarified with the present definition given in three dimensions. The graphs of the anti-submarining scales can be used as tools for checking the risk of submarining tendency in the geometrical design of the seat-belt system. The evaluations of the Part 572 dummy with modified abdominal tissue and pelvic shape at the notch are also presented. the submarining tendency, indicated by the relative occurrence number and the instant, are achieved more simulatively in the modified dummy than in the Part 572 dummy with respect to the human cadaver.

Leung, YC (Association Peugeot S.A.-Renault)   Tarriere, C   Fayon, A   Mairesse, P   Banzet, P
Society of Automotive Engineers, Incorporated   Conf Paper 811020, HS-032 412, 1981, pp 685-729, 17 Fig., 10 Tab., 15 Ref., 1 App.

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361167

FACTORS INFLUENCING THE ESTIMATION OF SUBMARINING ON THE DUMMY

Submarining is a phenomenon that may appear during the restraining of an occupant by a safety belt and it is ascribed to an important lesional factor mainly on the abdominal body segment and lumbar spine. This paper presents a literature overview and an in depth analysis of an accident survey which indicate that even if submarining may exist, it does not constitute a "safety belt syndrome" when considering the frequency of abdominal lesions. But these lesions are fairly often severe. As regards the approval standards tests, it is necessary to define an abdominal protection criterion. At present, two types of transducers are proposed for the display of submarining on the part 572 dummy and one of them, moreover, can be associated with an abdominal criterion. Our experimental study enabled us to compare the capabilities of the transducers. It is our feeling that these transducers can only be useful for the detection of submarining and that an abdominal protection criterion is still lacking. Moreover, it appears that some particular aspects of the human body model should be re-examinated in the abdomen-pelvis region in order to check that the dummy presents an acceptable "human-like" behaviour.

DeJeammes, M   Biard, R   Derrien, Y (National Council for Road Safety)
Society of Automotive Engineers, Incorporated   Conf Paper 811021, HS-032 413, 1981, pp 733-762, 1[illegible] Fig., 17 Ref.

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361168

RISK AND EFFECTIVENESS OF SEAT BELTS IN MUNICH AREA AUTOMOBILE ACCIDENTS

To assess the effectiveness of seat belts and the risk of adverse effects a 12-month accident field study was carried out, which covered all non-minor injured belted occupants. The criteria laid down were as comprehensive as possible to permit assessment in each case of whether or not the restraint system had reduced or possibly increased injury severity. Seat belts were found to reduce the number of non-minor, non-fatal injured occupants to about 1/10 of the figure for unbelted occupants. Depending on the type and locality of the accident, this ratio varies from 1/6 to 1/28. The risk of death is cut to about 1/4. With respect to non-minor injured belted occupants, in 63% of the cases injury severity was reduced, while adverse effects can be reckoned with in less than 1.3% (95% level). With respect to accidents in which non-belted occupants suffer non-minor injuries, this risk is reduced to 0.2% (99% level), and in at least 96% of all cases reduction of injury severity can be assumed.

Beier, G Schuller, E Spann, W (National Council for Road Safety)
Society of Automotive Engineers, Incorporated Conf Paper 811023, HS-032 414, 1981, pp 765-788, 8 Tab., 22 Ref.

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361169

PEDESTRIAN POST-IMPACT KINEMATICS AND INJURY PATTERNS

In this paper, frontal motor vehicle pedestrian collisions are classified according to post-impact pedestrian kinematics observed in real world vehicle vs. pedestrian accidents. Results from in-depth pedestrian accident investigations provide the medico-engineering basis for this study. It was found that impact-induced pedestrian motion is influenced by the relative configuration of the vehicle and pedestrian at impact as well as the vehicle's impact speed and deceleration rate. Injury patterns were found to be dependent on the trajectory type in addition to impact severity and characteristics of the vehicle and roadway. Five basic kinematic trajectories have been identified for frontal collision cases and are described as: wrap, forward projection, fender vault, roof vault, and somersault. Pedestrian injury patterns are analyzed for each of the trajectory types; an injury risk index is defined; and the associated injury risks are compared. It is hoped that classification of the characteristic injury patterns and trajectories can facilitate vehicle design improvements to reduce pedestrian injury severity.

Ravani, B Brougham, D Mason, RT (Traffic Safety Research Corporation)
Society of Automotive Engineers, Incorporated Conf Paper 811024, HS-032 415, 1981, pp 791-822, 19 Fig., 4 Tab., 7 Ref.

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361170

INJURY MECHANISMS IN HEAD-ON COLLISIONS INVOLVING GLANCE-OFF

The damage pattern of about 30% of accident vehicles with injured occupants corresponds to that created in offset head-on collisions. An accident reconstruction method using the vehicles' deformation energies as operands is introduced for this collision type. The parameters so determined are compared for accidents both with and without glance-off, and their effect on the different injury mechanisms of the belted driver is discussed. A theory is suggested regarding the cause of serious injuries to the lower extremities in glance-off accidents, and is supported by examples. To confirm the results crash tests involving glance-off are carried out.

Zeidler, F Stuertz, G Burg, H Rau, H
Society of Automotive Engineers, Incorporated Conf Paper 811025, HS-032 416, 1981, pp 825-860, 19 Fig., 8 Tab., 16 Ref., 1 App.

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361171

FACTORS ASSOCIATED WITH PELVIC AND KNEE INJURIES IN PEDESTRIANS STRUCK BY THE FRONTS OF CARS

The incidence of pelvic and lower extremity fractures is examined by reference to data extracted from police and hospital records. It is shown that the incidence and number of fractures to the pelvis and the lower extremities is strongly dependent on the age of the struck pedestrian and the speed of the vehicle. Pelvic injuries are shown to be more common in elderly females than in other age groups and it is suggested that this is due to elderly females being more likely, with current vehicle front end heights, to sustain a direct blow at the level of the pelvis. Pubic rami fractures appear to result when there are distributed impact forces at the level of the pelvis and acetabular fractures occur when there are concentrated forces applied to the greater trochanter. Injuries to the knee joint ligaments are shown to occur when there is an impact in the vicinity of the knee joint and can occur at speeds as low as 20 km/h although for complete rupture an impact speed of at least 35 km/h is required. It is suggested that the use of a simple impactor to control front structure compliance may not be sufficient and that a test procedure which controls hip reaction forces and knee joint angulation may be necessary.

Ashton, SJ (Birmingham University, England)
Society of Automotive Engineers, Incorporated Conf Paper 811026, HS-032 417, 1981, pp 863-900, 9 Fig., 19 Tab., 15 Ref., 3 App.

Proceedings of the Twenty-fifth Stapp Car Crash Conference, September 28-30, 1981, Jack Tar Hotel, San Francisco, California.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: Society of Automotive Engineers, Incorporated, 400 Commonwealth Drive, Warrendale, Pennsylvania, 15096

361172

RESULTS OF AN ANALYSIS OF TRUCK ACCIDENTS AND POSSIBILITIES OF REDUCING THEIR CONSEQUENCES DISCUSSED ON THE BASIS OF CAR-TO-TRUCK CRASH TESTS

Possibilities of improved truck safety regarding to frontal collisions with passenger cars are discussed. Characteristics of car/truck collisions are analysed in a study of 1,559 real accidents. Almost 40% of the fatalities in car/truck collisions result from front-to-front collisions. It turned out that the inevitably high mass of the truck does not constitute the only dominant problem in the majority of real--life accidents. Another major factor is the form aggressivity of the truck front which may be reduced by technical measures. Based on these results a series of 10 car-to-truck crash tests was carried out analysing two collision types: truck running frontally into car front, 60 kph; and truck running frontally into car side, 39 kph. The tests were made both with an unchanged truck and with safety modifications, using a large impact plate and an energy absorbing front protection. The large "impact plate" did not produce any appreciable safety effect in the chosen test conditions. However, as a result of slightly reduced car intrusion an effect cannot be ruled out in the lower speed range. The frontal protection with energy-absorbing construction and mobile design did result in improvements especially by reducing the override of the car by the truck. Quantifying this effect must be reserved for the subsequent series of tests, which should reveal an order of priority on the basis of benefit/cost analyses. The study showed that safety measures of the truck front are extremely difficult-as they may influence the practical requirements such as bumper clearance angle, length, weight etc.-but solutions are necessary and possible. This study aimed to work out a proposal of principle safety measures. It is discussed in which terms safety measures on trucks may be described. The requirements of further research work are indicated.

Danner, M Langwieder, K (Association of German Automobile Insurers)
Society of Automotive Engineers, Incorporated Conf Paper 811027, HS-032 418, 1981, pp 903-950, 29 Fig., 10 Ref.

Proceedings of the Twenty-fifth Stapp Car Crash Conference, September 28-30, 1981, Jack Tar Hotel, San Francisco, California.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: Society of Automotive Engineers, Incorporated, 400 Commonwealth Drive, Warrendale, Pennsylvania, 15096

361173

BOSOZOKU (HOT RODDERS' CLAN) AND CAR-ORIENTED YOUTH

The Bosozoku pattern in western Japan was investigated from the perspective of differences in social or cultural structure as well as in main characteristics of human nature between east and west. Also we inquired into the problems of Bosozoku in connection with car-orientedness of youth and revealed what aspects of individual psychological structure have strong influence on this nature. Based upon its result, we examined the possibility of making an estimate of the excessive degree of car-orientedness in its early stage. And there is a need in the future to develop programs for excessively car-oriented people to enter into traffic society.

Nagayama, Y Nagamachi, M Suzumura, A Nagaoka, T *IATSS Research* Vol. 5 HS-032 428, 1981, pp 3-5

Acknowledgment National Highway Traffic Safety Administration
Order From International Association of Traffic & Safety Sci, 6-20, 2-chome, Yaesu, Chuo-ku, Tokyo 104, Japan

361174

THE HIGHWAY LOSS DATA INSTITUTE...IDENTIFYING AND COMPARING THE INJURY AND OTHER LOSS EXPERIENCE OF MOTOR VEHICLES

This publication describes the Highway Loss Data Institute (HLDI) and summarizes its major findings to date. The highlights of HLDI findings about insurance losses under injury, collision, and comprehensive coverages are presented in 41 Figures. Detailed HLDI reports present additional information about each of the findings presented in this report. These additional reports are listed and available on request. Injury statistics are compiled using frequency of claims with payments exceeding $250, $500, $1,000 using only medical losses. Collision damage costs are presented as Relative Average Loss Payments Per Insured Vehicle Year for each vehicle model and for vehicle types. Comprehensive coverages are used to determine Relative Theft Average Loss Payments Per Insured Vehicle Year. Fire and vandalism payments made under the comprehensive coverage are excluded. These findings are also grouped to compare costs for car size, car body style, individual vehicle series, and a grouping of vans, pickup trucks and utility vehicles. Special Research Findings include the effects of the Federal Safety Bumper Standard, engine size, automatic and manual restraints, operator age, and garaging location.

Highway Loss Data Institute HS-032 429, 1981, 34p, 41 Fig.

Acknowledgment National Highway Traffic Safety Administration
Order From Highway Loss Data Institute, Watergate 600, Washington, D.C., 20037

361175

THE CALIFORNIA DRIVER FACT BOOK

The California Driver Fact Book is designed to provide a quick reference for traffic safety personnel and program administrators. The booklet contains information in three general areas: (1) basic driver record data; (2) enumerative and descriptive data on the California driving population and various subpopulations; and (3) evaluations of driver education, licensing, and driver improvement programs.

California State Department of Motor Vehicles 5th Ed Report No. 29, HS-032 430, Apr. 1981, 81p, 15 Fig., 41 Tab., Refs.

The user should contact the Research and Development Section to make known specific needs for additional information.

Acknowledgment National Highway Traffic Safety Administration
Order From California State Department of Motor Vehicles, Research and Development Section, P.O. Box 11828, Sacramento, California, 95813

361176

CARS THAT ALMOST FLEW

This article traces the history of flying cars, from the 1917 Curtiss Auto-Plane to the 1973 AVE Mizar, a combination of a Ford Pinto car and the airframe and engine from a Cessna Skymaster. The Mizar differed from earlier flying cars which were not at all compatible with the design of cars of their day. Poor design and prices well above the separate costs of owning both a car and a plane, doomed earlier models such as the Taylor Aero-Car, Waldo Waterman's Arrowbile, and the T.P. Hall Flying Car. The crash of the AVE Mizar on its maiden flight when a wing collapsed and the flying car whirled several hundred feet to the ground, killed not only the designer, but possibility of all future flying cars.

Bauman, R *California Highway Patrolman* Vol. 45 No. 7, HS-032 432, Sept. 1981, p 22, 5 Phot.

Acknowledgment National Highway Traffic Safety Administration
Order From California Association of Highway Patrolmen, P.O. Box 2631, Sacramento, California, 95812

361177

CHILD RESTRAINTS--THE SEATS THAT SAVE LIVES

Pointing out that good parenting begins with providing a safety seat for baby's first ride home from the hospital, this article discusses the reasons why child restraint should be practiced every time a child rides in the car. Following this discussion are a few comments on costs of safety seats, placement in the car, selecting the seat which has passed the crash tests and performs properly, safety seats for loan or rent, and tips for installing and using child safety seats.

Harmon, JA *Home & Away* Vol. 2 No. 3, HS-032 434, May 1981, pp 8-9, 2 Phot.

Acknowledgment National Highway Traffic Safety Administration
Order From Chicago Motor Club, 66 East South Water Street, Chicago, Illinois, 60601

361178

AUTOMOBILE INSURANCE LOSSES PERSONAL INJURY PROTECTION COVERAGES, CLAIM FREQUENCY RESULTS BY SIZE OF CLAIM 1978-1980 MODELS

This report presents injury claim frequency results for 1978-1980 model year cars. The frequency of all paid and pending claims combined, and the frequencies of paid claims exceeding $250, $500 and $1,000 respectively are shown for those cars with sufficient claims to be statistically valid. The results, based on the larger medical claims, indicate the frequency of occurrence of injuries of increasing severities. Each claim frequency result is in relative terms, with 100 representing the result for all cars combined in each claim size category. Thus, comparisons among vehicles must be made either within a particular claim size category, or by considering the sets of claim frequency results. The relative claim frequency results for the different claim size amounts are not directly comparable because the sets of relative results are based on different values of 100. The report is based on injury coverages and injury claims involving 1978 through 1980 models in the period from their introduction through December 1980. The results for vehicles discontinued prior to the 1980 model year, are not included in this report.

Highway Loss Data Institute Res Rpt HLDI I 80-1, HS-032 436, Sept. 1981, 35p, 3 Fig., 4 Tab., 4 App.

Acknowledgment National Highway Traffic Safety Administration
Order From Highway Loss Data Institute, Watergate 600, Washington, D.C., 20037

361179

COMBUSTION MODIFIED INTEGRAL SKIN URETHANE FOAM

The use of integral skin urethane foam in transportation vehicle interiors is presently limited to the automobile with a few exceptions such as bus and aircraft armrests. Nevertheless continued research and development on transportation crash-safety has emphasized use of integral skin, flexible and semiflexible urethane foams. There are still some problems associated with this material, particularly from its fire performance, which prevent a larger application. A new integral-skin urethane foam characterized by a combination of good mechanical properties and an improved fire performance is described. By comparison with conventional integral skin urethane foams either fire retarded or not, fire performance remains substantially unchanged and acceptable even after dry and humid aging.

Borsini, G Cipolla, M Pandolfi, G *Journal of Fire & Flammability* Vol. 12 No. 3, HS-032 437, July 1981, pp 250-257, 6 Tab., 20 Ref.

Acknowledgment National Highway Traffic Safety Administration
Order From Technomic Publishing Company, Incorporated, 265 Post Road West, Westport, Connecticut, 06880

361180

SPECIAL STUDY, COMMERCIAL VEHICLES IN COLLISIONS INVOLVING VEHICLES PARKED OR STOPPED ON HIGHWAY SHOULDERS

This is a pilot study of In-Depth Accident Reports involving commercial and noncommercial vehicles parked on highway shoulders. It covers accidents investigated by the Department of Transportation's Federal Highway Administration (FHWA) Bureau of Motor Carrier Safety during 9 calendar years (1967 through 1975). FHWA's field staff conducted in-depth accident investigations of 2,006 (.5%) of the 400,000 accident reports filed in this time period. Fifty eight (3%) of these 2,006 accidents involved commercial and/or non-commercial vehicles stopped on highway shoulders. These accidents resulted in 105 fatalities and 199 injuries. Forty seven of the accidents occurred on Interstate highways, 8 on U.S. highways, and three on State routes and city streets. Fifty two were rear-end collisions which resulted in ninety two fatalities. A truck collided with a car in thirty of the accidents, resulting in fifty six fatalities. The initial cause of the accident was dozing at the wheel in thirty one reports (thirty commercial drivers) which resulted in sixty three of the fatalities.

Federal Highway Administration   HS-032 438, 1977, 22p, 11 Phot.

ACKNOWLEDGMENT National Highway Traffic Safety Administration
ORDER FROM Federal Highway Administration, Bureau of Motor Carrier Safety, Washington, D.C., 20590

361181

COMPARATIVE EVALUATION OF SPEED CONTROL STRATEGIES. VOLUME 1. EXECUTIVE SUMMARY

This is the first of a two volume final statement of findings for Texas Traffic Safety Program contract no. 77-6300-30A whose goal was to develop a method for controlling traffic speeds which would increase the effectiveness of law enforcement agencies without increasing their manpower or operating costs. The study evaluates the effect of enforcement activities on vehicle speed both upstream and downstream of randomly located stationary patrol vehicles. Vehicle speeds were measured in both directions over several miles on test lengths of 2-lane and 4-lane highways under peak traffic conditions while the patrol car was parked parallel to the major traffic flow. Two separate programs were conducted. The first was a comparative evaluation of the effect of radar and non-radar equipped patrol vehicles. The second was an evaluation of two Speed Control Strategies to determine if the actual patrol vehicle presence could be eventually reduced without reducing its speed suppression capabilities. The study also evaluated the extent of the halo effect or zone of reduced speed, upstream or downstream of the stationary patrol vehicle. The report conclusions are intended to apply to a traffic population composed primarily of commuters.

Brackett, RQ   Edwards, ML
Texas Transportation Institute, Texas State Department of Public Safety, Texas Office of Traffic Safety Administration   Final Rpt.   TOTS 77-6300-30A, HS-032 439, Sept. 1977, 34p, 1 Fig., 4 Tab.
Contract

77-6300-30A

ACKNOWLEDGMENT National Highway Traffic Safety Administration
ORDER FROM Texas Transportation Institute, Texas A&M University, College Station, Texas, 77843

361182

GUIDELINES FOR DRIVER INSTRUCTION

Assesses pedagogical principles and methods of driver instruction, together with the objectives to be pursued. Presents contemporary driver instruction systems and improved procedures for driving instruction and driver performance evaluation.

Organization for Economic Cooperation and Devel   1982, 88p

ORDER FROM Bumpus, Haldane and Maxwell Limited, Document Center, Cowper Works, Olney, Bucks MK46 4BN, England

361298

AUTOMOBILE INSURANCE LOSSES PERSONAL INJURY PROTECTION AND COLLISION COVERAGES. THE EFFECTS OF CAR SIZE ON CRASH LOSSES 1977-1980 MODELS

This Highway Loss Data Institute (HLDI) report presents relationships between car size and body style and insurance losses. Results are presented for Personal Injury Protection coverages for 1977-1979 model year passenger cars and for Collision coverages involving 1978-1980 model year cars. The principal findings are: (1) Personal Injury Protection: (a) The frequencies of injury claims with medical payments exceeding various dollar thresholds were strongly influenced by car size; the smallest cars had the worst injury loss experience; and (b) Sports and specialty models had consistently higher frequencies of injury claims than two-door and four-door models of the same size; (2) Collision: (1) Small subcompact and subcompact models had above average collision losses, as did full-size luxury cars. Compact and intermediate models had lower than average results; and (2) Sports and specialty models had the highest collision losses in all car size groups. Two-door models consistently had higher losses than four-door models of the same size.

Highway Loss Data Institute   Res Rpt.   HLDI A-13, HS-032 483, May 1981, 24p, 6 Fig., 2 Tab., 1 App.

ACKNOWLEDGMENT National Highway Traffic Safety Administration
ORDER FROM Highway Loss Data Institute, Watergate 600, Washington, D.C., 20037

361299

FEDERAL MOTOR VEHICLE FLEET REPORT FOR FISCAL YEAR 1980 (OCTOBER 1, 1979-SEPTEMBER 30, 1980)

The Federal Motor Vehicle Fleet Report for fiscal year 1980 (October 1, 1979-September 30, 1980) is a compilation of Federal agency-held and leased motor vehicle fleet data supplied to the General Services Administration (GSA) by all Federal Agencies, worldwide. This report also includes costs and vehicle years of operation of motor vehicles leased by agencies from GSA's interagency motor vehicle fleet of over 95,000 vehicles. The data contained in this report covers the operation of vehicles used on official business and operated in various terrain and climatic conditions. These factors may cause wide cost variances, and therefore, it is difficult to make direct comparisons between agencies. However, the analysis of an individual agency's costs over a period of years will identify cost trends; therefore, the consolidated statistical data in this report will be helpful to Federal fleet managers. Fleet managers should be aware of these trends in order to provide the most cost efficient support to meet mission requirements. Adherence to the proven precepts of good fleet management in areas such as economical procurement, maintenance and repairs, utilization, replacement and disposal of their motor vehicles will be of material assistance to fleet managers.

General Services Administration   HS-032 506, 1981, 33p, 24 Tab.

ACKNOWLEDGMENT National Highway Traffic Safety Administration
ORDER FROM General Services Administration, Federal Fleet Management Division (TMM), Washington, D.C., 20406

361300

EMERGENCY VEHICLE OPERATION--POLICY AND PROCEDURES

Because police officers respond to emergency calls for assistance every day, emergency vehicle operation can become a routine act that leads to complacent-and perhaps careless-driving under such conditions. The officer must always exercise caution when operating a vehicle under emergency conditions. Further, he must evaluate all factors before making the basic decision to operate as an emergency unit.

Training Key   No. 271, HS-032 512, 1979, 5p

ACKNOWLEDGMENT National Highway Traffic Safety Administration
ORDER FROM International Association of Chiefs of Police, Inc, 11 Firstfield Road, Gaithersburg, Maryland, 20760

361301

EMERGENCY VEHICLE OPERATION--FRESH PURSUIT

Responsibility for the decision to employ emergency vehicle operations in a "fresh pursuit" rests with each officer. In arriving at his decision, the officer must carefully consider all factors involved, including the seriousness of the offense and the possible consequences of his actions. Most importantly, the safety of citizens is the officer's paramount consideration.

Training Key   No. 272, HS-032 494, 1979, 5p

ACKNOWLEDGMENT National Highway Traffic Safety Administration
ORDER FROM International Association of Chiefs of Police, Inc, 11 Firstfield Road, Gaithersburg, Maryland, 20760

361302

THE FOUR-WHEEL DRIVE AUDI QUATTRO

Following a brief review of the development of road vehicle transmissions, the Audi Quattro is introduced as a new vehicle using permanent four-wheel drive for all road conditions. The use of four-wheel drive with optimum engine capacity enables the Audi Quattro to avoid the disadvantages of excessive drive-wheel tyre width. The longitudinally mounted transmission layout, incorporating a central differential, is described, and the functional advantages of the four-wheel drive system are outlined.

Treser, W (Volkswagenwerk AG) *International Journal of Vehicle Design* Vol. 2 No. 2, HS-032 510, May 1981, pp 174-181, 13 Fig.

Acknowledgment: National Highway Traffic Safety Administration
Order From: Inderscience Enterprises Limited, La Motte Chambers, St Helier, Jersey, England

361303
EFFECTS OF THE NOISE OF STREET TRAFFIC IN SWITZERLAND A REVIEW OF FOUR SURVEYS

The results of four Swiss field studies of the relations between noise and annoyance in housing areas are presented and compared with those of recent studies elsewhere. In all these studies the degree of annoyance is taken to be the percentage of people "highly annoyed", and the ratio (noise level)/(% "highly annoyed") is found to be a non-linear function. In the Swiss studies the reasons for this non-linearity have been investigated by analysis of the effects of particular types of annoyance, such as disturbance of rest, of sleep or of communication.

Nemecek, J Wehrli, B Turrian, V (Swiss Federal Institute of Technology) *Journal of Sound and Vibration* Vol. 78 No. 2, HS-032 486, Sept. 1981, pp 223-234, 10 Fig., 1 Tab., 8 Ref.

Acknowledgment: National Highway Traffic Safety Administration
Order From: Academic Press Incorporated, Limited, 24-28 Oval Road, London NW1 7DX, England

361304
EXAMINATION OF AUTOMOBILE RUBBER GUARDS BY ATTENUATED TOTAL REFLECTANCE SPECTROSCOPY USING A FOURIER TRANSFORM INFRARED SPECTROMETER

A piece from an automobile rubber bumper guard was found at the scene of a hit-and-run accident and was compared to a sample obtained from the front bumper guard of a suspect's vehicle. The samples were examined by attenuated total reflectance spectroscopy using a Fourier transform infrared spectrometer with data system.

Blackledge, RD (US Army Criminal Investigation Laboratory-Europe) *Journal of Forensic Sciences* Vol. 26 No. 3, HS-032 503, July 1981, pp 554-556, 1 Fig., 4 Ref.

Acknowledgment: National Highway Traffic Safety Administration
Order From: Blackledge, RD, USACIL-Europe, APO, New York, 09757

361305
THE REAGAN AUTO PACKAGE. HOW NEW REGULATIONS WILL AFFECT CONSUMERS

This article describes some of the 34 orders and initiatives affecting the manufacture of American automobiles, handed down by the Reagan administration in early April 1981. Changes proposed by the National Highway Traffic Safety Administration (NHTSA) involve passive restraints, bumper standards, battery labeling, "field of vision" rules, seat belts, mileage targets, tire evaluations, metric speedometers, and numerous other items that will affect the function, appearance and price of automobiles offered for sale by U.S. manufacturers. The article contains a condensed version of these rule changes, with the official explanation of why the change is being sought. The Environmental Protection Agency (EPA) is also seeking changes which concern finer points of emission controls, and in many cases apply to trucks rather than passenger vehicles. A table, jointly published by NHTSA and EPA, indicating the aggregate effect of the suggested changes and the estimated dollar savings to industry and consumers is reprinted with the article.

Consumers' Research Vol. 64 No. 6, HS-032 502, June 1981, pp 11-14, 1 Tab.

Acknowledgment: National Highway Traffic Safety Administration
Order From: Consumers' Research, Incorporated, Washington, New Jersey, 07882

361306
ELECTRONIC FUEL INJECTION: DIESELS ARE NEXT

This article describes the type of electronic fuel injection that will be required to refine automobile diesel engine performance in the next several years, as more stringent diesel emission standards evolve. The seven fundamental characteristics of a diesel engine fuel injection system are currently satisfied by a variety of system mechanics with the controls integrated into a centralized distributor type of injection pump. However, injection timing, fuel quantity metering, idle and maximum rpm control, and maximum fuel limit are well suited to electronic control of a closed loop design that will provide feedback measurements of fuel quantity and injection timing. The introduction of microprocessor control can also lead to the addition of secondary systems or functions at minimal cost. In the case of electronic diesel controls, typical examples would include cruise control, diagnostics, display functions and transmission control.

Jones, TO Trenne, MU (TRW Automotive Worldwide) *IEEE Spectrum* Vol. 18 No. 5, HS-032 492, May 1981, pp 30-34

Acknowledgment: National Highway Traffic Safety Administration
Order From: Institute of Electrical & Electronics Engrs, Inc, 445 Hoes Lane, Piscataway, New Jersey, 08854

361307
GONE...LONG GONE

This article is the second of a series discussing motorcycle theft. It describes the background of the current seventeen character manufacturer Serial Number or VIN (vehicle identification number) which the National Highway Traffic Safety Administration (NHTSA) requires on all 1981 or later models, and discusses its use by different manufacturers. The article describes the problems encountered in recovering stolen motorcycles, due to the improper recording of serial numbers on titles, the failure to stamp the entire serial number on the unit in locations other than on the easily removed Federal Identification Plate, the lack of uniformity in numbering pre 1981 motorcycles, and the ease with which thieves title self-assembled motorcycles in some juridictions. Several solutions are offered to combat the growing number of thefts and its effect on motorcycle insurance policy costs.

Harrison, G *American Motorcyclist* Vol. 45 No. 11, HS-032 517, Nov. 1981, p 19, 15 Phot.

Acknowledgment: National Highway Traffic Safety Administration
Order From: American Motorcyclist Association, P.O. Box 141, Westerville, Ohio, 43081

361308
EXPLODING TIRES (PART II)

This is the second part of an article written by a licensed engineer and trial attorney, describing the technical evaluation of tire blow-outs. It is directed towards the expert witness who must testify in law suits resulting from accidents caused by rapid tire failure. The technical causes for tire failure and the investigation procedures used to determine manufacturing defects, are described. The four most common defenses in exploding tire lawsuits, and their weaknesses are listed. The article stresses the need for an informed logical failure analysis, and a rational technical explanation that "educates" and convinces the jury, and the presentation of pertinent information that will overcome the expected defenses.

Peters, GA *Trial* HS-032 505, Apr. 1981, pp 50-52
For Part 1, see HS-032 146.

Acknowledgment: National Highway Traffic Safety Administration
Order From: Association of Trial Lawyers of America, 1050 31st Street, NW, Washington, D.C., 20007

361309
FRONT END AND STEERING

This is the first of a series of articles prompted by a deteriorating economic environment that is causing more motorists to keep their present vehicle longer, resulting in an upswing in complete rebuilding of component systems, rather than investing in simple repair and maintenance expenses. The front end of most conventional rear-wheel-drive cars can be rebuilt in considerably less time than the total sum of the time required to perform each individual repair procedure. The article describes the diagnostic inspection required so the repairman can accurately describe the condition of each component to the customer. It also includes fifteen captioned photos, with a twenty two step sequence showing the complete rebuilding of a twelve year old Chevrolet that was a typical GM front suspension and steering system with unequal control arm front suspension.

Stenquist, P *Motor* Vol. 155 No. 5, HS-032 511, May 1981, p 37, 16 Phot.

Acknowledgment: National Highway Traffic Safety Administration
Order From: Hearst Books, Motor Books Department, 224 West 57th Street, New York, New York, 10019

361310

THE GREAT GASOHOL DEBATE

This article attempts to explore the whole gasohol question by evaluating the state-of-the-art in mid-1981. The gasohol debate concerns a complex set of interactions involving, primarily, these five questions: (1) What are the economics of gasohol; (2) Do you use more energy to make alcohol than you gain; (3) What would additional demand for corn do to our farmland and to farming; (4) Would gasohol help our balance of payments; and (5) Would using corn to produce fuel send fuel prices skyrocketing? Although the experts cannot agree on the answers to these questions, the article presents the current thinking on both sides of each problem, and how each problem interacts with the others.

Edelson, E *Popular Science* Vol. 219 No. 1, HS-032 515, July 1981, pp 53-55

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: Times Mirror Magazines, Incorporated, 380 Madison Avenue, New York, New York, 10017

361311

AN EXPERIMENTAL STUDY ON THE ACOUSTIC GUIDANCE SYSTEM FOR BLIND PERSONS' WALKING

Blind persons mostly depend on white sticks or seeing-eye dogs in walking in urban areas, although there are acoustic signals at some crossings. One conceivable way to facilitate their walking is to guide them along a walking path by means of sound signals. Few studies, however, have been made on the effects of such signals on the walking of the blind. This paper analyzes the results of various experiments conducted on three kinds of walking-straight walking, turning, and obstacle avoidance walking-in order to find out the basic features of the effects of sound signals on the walking of the blind.

Tsukio, Y (Nagoya University, Japan) Kitajima, H (Kitano Construction Company, Limited) Inoue, S *IATSS Research* Vol. 5 HS-032 504, 1981, pp 91-100, 14 Fig., 3 Tab., 2 Ref.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: International Association of Traffic & Safety Sci, 6-20, 2-chome, Yaesu, Chuo-ku, Tokyo 104, Japan

361312

ESTIMATES OF DIRECT COSTS TO THE STATE RESULTING FROM TRAFFIC ACCIDENTS

This is the final report for the project entitled "Estimates of Direct State Costs to the State Resulting From Traffic Accidents," sponsored by the State of Michigan Office of Highway Safety Planning. The project aimed to provide quantitative estimates of traffic accident-related direct expenditures from state tax revenues as a result of traffic accidents. This report serves three purposes. The first is to detail the methodology and the sources of data. The second is to present estimates of the costs. The third is to show how the cost estimates can be used to estimate the likely benefits of countermeasures related to highway safety. The estimated annual direct cost to the state has been computed to be 21.5 million dollars, with 13.9 million associated primarily with injuries, 2.7 million with property damage, and 4.9 million associated with both injuries and property damage.

Andary, JJ Flora, JD Huelke, DF O'Day, J
Highway Safety Research Institute, Department of State Police Final Rpt. UM-HSRI-81-40, HS-032 498, Aug. 1981, 98p, 1 Fig., 33 Tab., Refs.
Contract

MTR-80-001A

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: Highway Safety Research Institute, Huron Parkway and Baxter Road, Ann Arbor, Michigan, 48109

361313

GUIDE FOR ESTIMATING URBAN VEHICLE CLASSIFICATION AND OCCUPANCY

This manual provides sampling and data collection procedures for field surveys that estimate vehicle classification and occupancy and (when combined with estimates of vehicle-miles of travel derived from parallel mechanical traffic counting programs) that estimate travel by vehicle type and person travel. Because sound statistical sampling techniques are used, these surveys can provide valid estimates at predetermined levels of precision and at the lowest possible cost.

Ferlis, RA
Peat, Marwick, Mitchell and Company, Federal Highway Administration Final Rpt. HS-032 518, Mar. 1981, 60p, 4 Fig., 15 Tab., 4 App.
Contract

DOT-FH-11-9249

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: NTIS

361314

ELECTRONIC ADVERTISING ALONG HIGHWAYS--CONCERN FOR TRAFFIC SAFETY

Developments in electronics, computers, and communications are being applied to traffic signs. One of the most advanced developments is the lamp matrix system which is one form of a commercial electronic variable message sign (CEVMS). Although a 1978 amendment to the Highway Beautification Act legitimized commercial signage using the latest technology, earlier federal laws still in force prohibited signs illuminated by flashing, intermittent, or moving light or signs that move or have animated or moving parts. The Federal Highway Administration through research and field observations demonstrated that CEVMS's have the potential for animation and for flashing, moving, and intermittent message presentation, and some operating signs already display these characteristics. In addition a correlation was established between roadside advertising and traffic accidents.

Wachtel, J *Public Roads* Vol. 45 No. 1, HS-032 493, June 1981, pp 1-5, 16 Ref.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: Federal Highway Administration, 400 7th Street, SW, Washington, D.C., 20590

361315

THE FUTURE OF TRAFFIC SIMULATION

The Federal Highway Administration (FHWA) Office of Research has long been a leader in traffic simulation. NETSIM, probably the most widely used traffic simulation program in the world today, was originally developed under contract to FHWA and has been modified and extended by the Office of Research many times. Many other developments in traffic simulation originated in the Office of Research, where modification of old programs and development of new programs are continuing efforts. This article projects the future of traffic simulation--what features traffic simulation programs will have 20, 30, or even 50 years from now. The statements in the article are necessarily hypothetical and subjective and will exclude ideas on traffic simulation that are currently being developed or planned. Pilot studies or preliminary research on nearly all of the features described will not be incorporated into publicly released traffic simulation programs within the next 5 years.

Ross, P *Public Roads* Vol. 45 No. 2, HS-032 514, Sept. 1981, pp 75-79

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: Federal Highway Administration, 400 7th Street, SW, Washington, D.C., 20590

361316

HOMICIDES, NON-TRAFFIC ACCIDENTS, AND PROPORTION OF YOUNG DRIVERS PREDICT TRAFFIC FATALITIES

The relation of violence/aggression and other macro-level variables to traffic accidents was investigated by applying multiple regression to 1977 data from each of the 50 states and the District of Columbia. Motor-vehicle-accident fatalities per registered vehicle was the dependent variable. The independent variables were homicide rate, suicide rate, fatality rates from other causes, unemployment rate, personal income, density of physicians, alcohol consumption, motor vehicles per capita, road mileage per vehicle, sex and age distribution of drivers, and attained education. The main finding is that homicide rates (but not suicide rates) predict states' motor-vehicle-accident fatalities; additional significant predictors are the proportion of young drivers, and fatalities from accidents other than those connected to motor vehicles. These three variables account for 68% of the variance of motor-vehicle-accident fatalities. The findings are discussed in terms of the contribution of aggression/violence, general risk-taking, and lack of driving experience to motor-vehicle accidents.

Sivak, M
Highway Safety Research Institute UM-HSRI-81-45, HS-032 507, Sept. 1981, 16p, 3 Tab., Refs.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: Highway Safety Research Institute, Huron Parkway and Baxter Road, Ann Arbor, Michigan, 48109

361317

EMERGENCY VEHICLE WARNING SYSTEMS

The subject of visual and auditory warning devices (lights and sirens) for emergency and service vehicles is surveyed from a broad perspective. The report should provide directly useful information at all levels from the selection of hardware to a general understanding of the psychophysical factors determining the effectiveness of these devices. Topics covered include: an analysis of warning signals; the present situation and the need for uniform national standards; suggested performance standards for warning light systems and for sirens, including the reasons for the principal requirements; recommendations for actions that can be taken to improve the signal effectiveness of emergency vehicles; and brief summaries of some of the physical measurements that are made on a selection of lights and sirens.

Rubin, AI Howett, GL
National Bureau of Standards, Department of Justice NBS Spec Pub 480-37, HS-032 495, May 1981, 25p, 4 Fig., 5 Tab., 11 Ref., 1 App.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: GPO

361318

THE EFFECTS ON ACCIDENTS OF COMPULSORY USE OF RUNNING LIGHTS DURING DAYLIGHT IN SWEDEN

The report is an attempt to describe the effects on accidents of compulsory use of running lights--low beam or special lamps--during daylight in Sweden. The study is carried out on police reported traffic accidents with personal injury in Sweden. The before and after periods are two years before and two years after the operative day of the law, October 1st 1977. The use of running lights in the before-period was roughly speaking 50% and in the after-period over 95%. The basic assumption is that the use of running lights in daylight influences multiple accidents in daylight and only those. The method used is to study the relation of daylight to darkness numbers of multiple accidents. The corresponding relation for single vehicle accidents is taken as control. The estimated total effect depends both on the subdivision of accident data and the method used for accidents with unprotected road users. The estimates vary from 6 to 13% reduction--from the before-period to the after period--of multiple accidents during daylight or 450 to 1100 less police reported accidents with personal injury per year. The estimated effects are not significant on a 5% level.

Andersson, K Nilsson, G
National Swedish Road & Traffic Research Institute VTI Rapport 208A. HS-032 488, 1981, 33p, 5 Fig., 16 Tab.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: National Swedish Road & Traffic Research Institute, Fack, S-581 01 Linkoeping, Sweden

361319

EFFECTS OF THE RAISED LEGAL DRINKING AGE ON MOTOR VEHICLE ACCIDENTS IN MICHIGAN

Motor vehicle accidents in Michigan during the period 1972-1979 were analyzed to examine whether the change in legal drinking age (from 18 to 21, December, 1978) affected the numbers of 18-to-20-year-old drivers involved in alcohol-related crashes during 1979. Box-Jenkins time-series models were applied to monthly crash data for the years 1972-1979 for alcohol-related and non-alcohol-related accidents involving drivers aged 18-20, 21-24, and 25-45. The study results showed that for drivers aged 18-20, the actual total of alcohol-related crashes for 1979 was 31 percent less than the total expected for 1979, based on the time-series analyses of the 1972-1978 data. In contrast, actual alcohol-related crashes among drivers aged 21-24 were 9 percent higher than expected, and among drivers aged 25-45 were 5 percent higher than expected. The same trends by age were evident in the actual crash totals for 1979 vs. 1978, but differences revealed by use of the time-series models are more valid than comparison of year-to-year changes.

Wagenaar, AC *HSRI Research Review* Vol. 11 No. 4, HS-032 487, Jan. 1981, 8p, 2 Fig., 2 Tab., Refs.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: Highway Safety Research Institute, Huron Parkway and Baxter Road, Ann Arbor, Michigan, 48109

361320

EFFECTS OF SPEED LIMIT ALTERATIONS ON ROAD SAFETY

The Metropolitan Police Department has recently changed the speed limit from 40 km/hr to 50 km/hr on some arterial roads within Tokyo. We took this opportunity of conducting two analytical research projects on the relationship between driving speed and traffic accidents outbreak. The first one carried out is the analysis of accident outbreak conditions before and after the speed limit alterations made on several roads in 1978. The second one conducted is the comparative analysis on accident outbreak on the roads where the speed limit had been alterated and where it had not. From the results of those analyses, it was concluded that the speed limit alteration mentioned above resulted in an increase in driving speed but did not exert an unfavorable influence upon traffic accidents outbreak.

Koshi, M Kashima, S (Tokyo University, Japan) *IATSS Research* Vol. 5 HS-032 485, 1981, pp 6-15, 8 Fig., 10 Tab., 5 Ref.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: International Association of Traffic & Safety Sci, 6-20, 2-chome, Yaesu, Chuo-ku, Tokyo 104, Japan

361321

THE EFFECT OF RAISING THE LEGAL MINIMUM DRINKING AGE ON FATAL CRASH INVOLVEMENT

In the early 1970's, many states in the U.S. lowered their legal minimum drinking ages, resulting in increased fatal crash involvement among young drivers. Beginning in 1976 and continuing into the 1980's, some of these states raised their drinking ages. The present study, conducted in nine states in which the drinking ages were raised, found that this resulted in reductions in fatal crash involvement among drivers the law changes applied to, especially in types of fatal crashes in which alcohol is most often involved. The reductions in the nighttime fatal crash involvement of such drivers, that occurred in eight of the nine states, ranged from 6 to 75 percent. On average, a state that raises its drinking age can expect about a 28 percent reduction in nighttime fatal crash involvement among drivers the law change applies to. It was estimated that in the 14 states that had raised their drinking ages as of January 1981, the result each year is about 380 fewer young drivers involved in nighttime fatal crashes. In the 31 states that still had a legal minimum drinking age less than 21 as of that date, it is estimated that each year there could be about 730 fewer young drivers in nighttime fatal crashes if the legal drinking age were raised to 21.

Williams, AF Zador, PL Harris, SS Karpf, RS
Insurance Institute for Highway Safety HS-032 481, June 1981, n.p., 3 Fig., 4 Tab., 6 Ref.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: Insurance Institute for Highway Safety, Watergate 600, Washington, D.C., 20037

361322

THE EFFECTS ON VEHICLE SPEEDS OF ROADSIDE SAFETY POSTERS: PHASE III

Since two previous studies on the use of roadside safety posters gave conflicting results, a third study was conducted. The posters used were of double crown size with the legend WATCH YOUR SPEED 30 MPH LIMIT. They had red lettering on white or black backgrounds and were placed on lamp columns. Results of this study are presented in tabular form. There is a discussion of the results with several conclusions drawn and an appraisal of the results obtained from all three studies.

Simmonds, AG (Greater London Council) *Traffic Engineering and Control* Vol. 22 No. 8-9, HS-032 491, Aug. 1981, pp 480-485, 6 Tab., 1 Ref.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: Printerhall Limited, 29 Newman Street, London, England

361323

ENERGY CONSERVATION AND THE FEDERAL-AID HIGHWAY PROGRAM

The basic question facing the Federal Highway Administration is how to provide leadership in developing methods to curb the Nation's longstanding appetite for more fuel consumption and still provide needed transportation services. This publication presents some of the methods (and resulting benefits) that the Federal Highway Administration, in cooperation with the States, is using to meet this energy conservation challenge. The following areas are addressed: planning, design considerations, construction and maintenance, traffic operations, ridesharing and high occupancy vehicle incentives, and transportation system management. In conclusion, it is pointed out that the total Federal Highway Administration organization has begun to think "ENERGY" and to redirect its programs to meet the new challenges.

Federal Highway Administration, HS-032 496, June 1981, 33p, Phots., 1 App.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: GPO

361324

HEADLAMPS AND VISIBILITY LIMITATIONS IN NIGHTTIME TRAFFIC

This article discusses the problems involved in trying to see adequately while driving at night and the limitations of all headlighting systems. Despite substantial improvement in headlamp performance low beams, which are the ones used by most drivers, do not provide adequate visibility distance under many driving conditions. No improvement in design is foreseen in the near future since the major limitations are the human visual system and some practical problems associated with headlamps mounting and conditions of use.

Olson, PL Sivak, M (Highway Safety Research Institute) Henson, DL (Huron High School) *Journal of Traffic Safety Education* Vol. 28 No. 4, HS-032 520, July 1981, pp 20-22, 1 Fig., 2 Tab.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: California Association for Safety Education, 2784 West Wilberta Lane, Anaheim, California, 92804

361325

GILLILAND OFFERS SEVEN SUGGESTIONS TO REDUCE THEFT

This is an excerpt of an address made by National Automobile Theft Bureau President P. W. Gilliland at the Auto Theft Investigators 29th Annual Seminar in Houston. It describes the following topics as areas for action: salvage control, false police reports, insurance fraud laws, immunity statutes to allow insurance companies to cooperate more freely with law enforcement authorities, restitution legislation, improved export controls for stolen vehicles, and heavy equipment theft. NATB maintains an excess of 2.2 million online records in its computerized North American Theft Information System which is available to law enforcement investigators, along with a growing file of salvage reports. NATB Special Agents are strategically located throughout the country. The speaker urges law enforcement agencies to avail themselves of these facilities.

NATB Journal HS-032 516, 1981, p 1

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: National Automobile Theft Bureau, 10330 South Roberts Road, Palos Hills, Illinois, 60482

361326

EFFECTS OF SHORT-TERM REHABILITATION ON ALCOHOL CONSUMPTION AND DRINKING-RELATED BEHAVIORS: AN EIGHT-MONTH FOLLOW-UP STUDY OF DRUNKEN DRIVERS

This study assesses the effects of short-term alcohol treatment intervention on subsequent drinking behavior and drinking-related problems. Subjects were 436 persons arrested for driving while intoxicated in Phoenix, Arizona. Subjects were screened to determine social or problem drinker classification and then randomly assigned to either treatment or comparison group conditions. Improvement was inferred from response changes to a questionnaire and personal interview administered immediately before and again at 8 months following entry into treatment. Results indicated that short-term treatment intervention had no more effect than minimal exposure in improving the quality of social or problem drinkers' life situations. The findings suggest a need for more innovative research strategies, and a commitment to the development of longer and more therapeutically oriented treatment programs.

Swenson, PR (City of Phoenix Municipal Court) Clay, TR (California University, Irvine) *International Journal of the Addictions* Vol. 15 No. 6, HS-032 484, Aug. 1980, pp 821-838, 5 Fig., 2 Tab., Refs.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: Dekker (Marcel), Incorporated, 270 Madison Avenue, New York, New York, 10016

361327

GUIDEWAY SNOW AND ICE CONTROL AND ROADSIDE MAINTENANCE

This Record contains the following papers: Design Approach for Thermal Removal of Snow and Ice on Automated-Transportation-System Guideways, T. J. Kramer; Wind-Tunnel Analysis of the Effect of Plantings on Snowdrift Control, S. L. Ring; Alternatives to Sodium Chloride for Highway Deicing (Abridgment), S. A. Dunn and R. U. Schenk; Deferred Maintenance, M. F. Creech; Roadside Management, R. L. Berger and D. R. Anderson; Minimizing Roadway Salt Problems in Maine (Abridgment), K. M. Jacobs and R. Scofield.

Transportation Research Record No. 776, HS-032 519, 1980, 27p, Figs., Tabs., Refs.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: TRB Publications Off

361353

MOTOR VEHICLE AND MACHINERY REPAIRERS

This publication is reprinted from the Occupational Outlook Handbook, 1980-81 edition; U.S. Department of Labor, Bureau of Labor Statistics, Bulletin no 2075-24. It describes the following occupations: Auto Body Repairers; Automobile Mechanics; Automobile Painters; Automobile Parts Counter Workers; Automobile Service Advisors; Boat Engine Mechanics; Farm Equipment Mechanics; Gasoline Service Station Attendants; Motorcycle Mechanics; and Truck Mechanics and Bus Mechanics. Each occupation is subdivided into the following subject matter: Nature of the work; Working Conditions; Places of Employment; Training, Other Qualifications and Advancement; Employment Outlook; Earnings; Related Occupations; and Sources of Additional Information.

Department of Labor Bulletin 2075-24, HS-032 556, 1979, 16p, Phots. Reprinted from the Occupational Outlook Handbook 1980-81 Edition.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: GPO

361354

JUICE BRAKES

A hydraulic brake booster unit--Hydro-Boost--uses hydraulic pressure from the power steering system, to help the motorist apply the brakes. Hydro-Boost Units are made by Bendix and used by GM and Ford. This article describes the advantages of the Hydro-Boost over conventional vacuum boosters, the unit components and its operating principles. It also details the diagnosis and repair of a typical Hydro-Boost unit in simple language. Specific step-by-step disassembly and assembly instructions are given as captions for the fourteen photos accompanying the text.

Stenquist, P *Motor* Vol. 155 No. 4, HS-032 527, Apr. 1981, p 43, Phots.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: Hearst Books, Motor Books Department, 224 West 57th Street, New York, New York, 10019

361355

TIRE BASICS. A LITTLE HELP TO AID YOU IN CHOOSING THE RIGHT RUBBER FOR YOUR CAR

This article evaluates the three types of tire construction in use today: bias-ply, radial, and a combination called bias-belted. The strong and weak points of each type are discussed, as well as the various materials used in tire construction. Each component of the standard tire size designation is explained, as is DOT designation which is also stamped on all tires legally sold for road use. Since 1979, the government has further required molded in markings disclosing the government's Uniform Tire Quality Grading standards which give an approximation of the tire's expected performance. These markings are also explained. Examples of various usage requirements are cited to show that there is no one "best" tire for every situation. The various trade-offs are discussed. The implications of tire inflation pressure are examined, as is the proper method of mixing different types of tires on a vehicle. Sketches portray the basic methods of tire construction, the tire aspect ratio, tire rotation, and the tread wear grade. A sketch and list of definitions are included to illustrate the basic component units of a tire.

Frank, L *Motor Trend* Vol. 33 No. 10, HS-032 528, Oct. 1981, pp 61-65

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: Petersen Publishing Company, 8490 Sunset Boulevard, Los Angeles, California, 90069

361356

AUTOMOTIVE ELASTOMERS

This article contends that the "world car" concept will lead to standardized components of world-wide manufacture. Energy requirements will figure in material selection, not only regarding the basic content of the material, but also in relation to later fabrication costs, assembly labor savings, and eventually potential fuel savings due to lighter weight over the useful life of the vehicle. It notes that 1982 autos mark the first time since the 1968 model year, that one tire construction (radial) has been standard equipment for all US auto manufacturers. Many other uses of elastomers in 1981 are cited, including elastomeric silicone to protect electronic circuitry from heat, shock, and weather; new EPDM hose construction for fresh air intake; ethylene-acrylic elastomer for oil seals; glass-reinforced nylon sheets which can be processed on existing metal-stamping presses; reinforced reaction injection molded (RRIM) polyurethane foam for auto seats, protective padding and sound deadening. Urethane-based adhesives are also discussed.

Murtland, WO, Editor *Elastomerics* Vol. 113 No. 10, HS-032 525, Oct. 1981, p 39, 7 Fig., 1 Tab., 4 Ref.

Acknowledgment: National Highway Traffic Safety Administration
Order From: Communication Channels, Incorporated, 6285 Barfield Road, Atlanta, Georgia, 30328

361357

RIM URETHANE ELASTOMERS: APPLICATIONS FOR THE 80S

This article describes the advancements of the reaction injection molding (RIM) process, to produce urethane elastomer parts, since its first commercial usage in 1974. By the end of the decade, RIM elastomers were being produced at an annual rate of over forty million pounds, mostly for soft automotive fascia and bumper covers. Extensive programs to develop both chemical systems and processing equipment have resulted in additional applications for automotive components, spoilers, fender flares, air dams, and decorative trim parts. The development of the technology to produce reinforced reaction injection molded (RRIM) parts, has, more recently, opened up additional automotive potential for fenders and other exterior body skin components. The article reviews the advantageous features of RIM processing and its potential uses outside the automotive industry.

Lewis, GD (Union Carbide Corporation) *Elastomerics* Vol. 113 No. 10, HS-032 524, Oct. 1981, pp 45-48, 6 Fig.

Acknowledgment: National Highway Traffic Safety Administration
Order From: Communication Channels, Incorporated, 6285 Barfield Road, Atlanta, Georgia, 30328

361358

INSURANCE IN THE NEW ADMINISTRATION

This article examines the impact of the 1980 election of a conservative White House and Senate, on the insurance industry. The move towards "deregulation" of business has caused Federal policy makers to search for regulatory surrogates, in matters affecting public safety. With increasing frequency, financial responsibility schemes are being enacted as a means of enlisting insurers as policemen of business conduct. Pressure for this quasi-regulatory status for the insurance industry, is bound to increase as the political focus shifts from personal lines issues to commercial lines issues, such as motor carrier liability.

Butterfield, B *Journal of Insurance* Vol. 42 No. 5, HS-032 538, Sept. 1981, pp 2-6

Acknowledgment: National Highway Traffic Safety Administration
Order From: Insurance Information Institute, 110 William Street, New York, New York, 10038

361359

LET'S STOP THE STOLEN CAR TRAFFIC

This is a description of the Motor Vehicle Theft Law Enforcement Act of 1981 (H.R. 2639), as proposed by the author, to address the vehicle theft problem on a national and international basis, through uniform nation-wide controls. The act contains provisions to control motor vehicle exports, number major component parts of motor vehicles, study vehicle security systems, outlaw interstate transport of stolen vehicle parts, include motor vehicle titles as "securities" in the National Stolen Property Act, and study off-highway mobile equipment theft. The bill would elevate to federal crime status the removal, obliteration or tampering with federally-mandated vehicle identification numbers, and the trafficking of motor vehicles, or motor vehicle parts which have had their identification numbers removed or altered.

Green, B (United States House of Representatives) *Journal of Insurance* Vol. 42 No. 5, HS-032 546, Sept. 1981, pp 8-12

Acknowledgment: National Highway Traffic Safety Administration
Order From: Insurance Information Institute, 110 William Street, New York, New York, 10038

361360

THE JAPANESE AUTOMOBILE INDUSTRY: MODEL AND CHALLENGE FOR THE FUTURE?

This publication of the proceedings of a public seminar held in January 1981 includes twelve formal papers and expanded transcripts of two question and answer sessions held between the audience and the conference panelists. The purpose of the conference was to begin addressing the critical issues facing the American automobile industry, with particular, but not exclusive, attention to examining the role of the Japanese auto industry. The organizers' intent was to probe the sources of Japanese competitive strength, especially those features whose study might profit the American automotive industry, rather than simply conduct a rational discussion of the trade issue. The authors include elected and appointed U.S. government officials, labor officials, American and Japanese automotive officials, consultants and members of the U.S. academic community.

Cole, RE, Editor *Michigan Papers in Japanese Studies* No. 3, HS-032 543, 1981, 147p

Acknowledgment: National Highway Traffic Safety Administration
Order From: Michigan University, Ann Arbor, Center for Japanese Studies, Ann Arbor, Michigan, 48109

361361

LEGAL SYSTEM OF JAPAN ON MOTOR VEHICLES, PART 2 MOTOR VEHICLE SAFETY REGULATIONS

The state of motor vehicle accidents in Japan is given and compared to traffic accidents in foreign countries. Safety measures in fields other than motor vehicles are outlined: improvement of the environment and countermeasures from the human side. The third section of the article gives the present situation of safety regulations for motor vehicles: safety regulations for road vehicles (extracts of the Road Vehicle Act are included) and main amendments to the safety regulations made recently. The fourth and final section gives the future trends of motor vehicle safety regulations.

Morisaki, K Takahashi, K (Ministry of Transport, Japan) *JSAE Review* No. 4, HS-032 545, Mar. 1981, pp 131-143, 4 Fig., 9 Tab., 2 Phot.

Acknowledgment: National Highway Traffic Safety Administration
Order From: Society of Automotive Engineers of Japan, Inc, 10-2 Goban-cho, Chiyoda-ku, Tokyo 102, Japan

361362

1979 IOWA MOTOR VEHICLE ACCIDENTS

This report presents a summary of Iowa motor vehicle accidents: Iowa trends 1968-79, National trends 1968-79, vehicle miles/fatalities 1968-79, time: fatal/all accidents, driver: age/sex, drinking and driving, holiday fatalities 1962-79, pedestrians, and counties. The next section concerns vehicles involved in accidents by type: Automobiles, buses, cycles, farm vehicles, motor homes, recreational vehicles, trains, and trucks. The report also includes a glossary and a sample of the Investigating Officer Report Form.

Iowa Department of Transportation HS-032 542, Dec. 1980, 52p

Acknowledgment: National Highway Traffic Safety Administration
Order From: Iowa Department of Transportation, Office of Safety Programs, Lucas Building, Des Moines, Iowa, 50319

361363

HIGHWAY ACCIDENT REPORT--D & J TRANSPORTATION CO., COMMUTER BUS RUN-OFF-ROADWAY, I-95 NEAR TRIANGLE, VIRGINIA, FEBRUARY 18, 1981

About 4:36 p.m., on February 18, 1981, a D&J Transportation Company commuter bus occupied by the driver and 23 passengers was southbound in the median traffic lane of I-95 near Triangle, Virginia. As the bus approached the Chopawamsic Creek bridge, it veered to the driver's right, traveled across the right traffic lane, an acceleration lane, and off the pavement. The right front of the bus struck and overrode a W-section guardrail, 59 feet north of the Chopawamsic Creek bridge parapet. After the left front of the bus struck the north end of the parapet, the bus became airborne and vaulted about 84 feet horizontally before landing on its right front in the creek, about 25 feet below the highway surface. The bus came to rest on its right side, roughly perpendicular to and facing the bridge, in about 2 feet of water. Eleven bus occupants, including the driver, were killed and 13 passengers were injured. The National Transportation Safety Board determines that the probable cause of this accident was the separation of a severely worn steering linkage ball joint connection which resulted in the jamming of the steering linkage and prevented the driver's controlling the steering of the bus. Contributing to the cause of the accident were ineffective inspection procedures followed by both the operator and the State inspection agency which failed to detect the worn ball joint assembly, and the steering system design which included mechanical components that could gradually deteriorate with no forewarning of impending failure and which did not incorporate fail-safe features.

National Transportation Safety Board NTSB-HAR-81-6, HS-032 521, Aug. 1981, 48p, 20 Fig., 1 App.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: NTIS

PB82-102385

361364

HIGHWAY ACCIDENT REPORT--MULTIPLE-VEHICLE COLLISIONS AND FIRE, INTERSTATE 15, NEAR SAN BERNARDINO, CALIFORNIA, NOVEMBER 10, 1980

About 7:25 a.m. on November 10, 1980, southbound traffic on Interstate Route 15 suddenly encountered dense fog north of the Highland Avenue offramp near San Bernardino, California, that reduced visibility to between zero and 50 feet. Drivers, whose vehicles were traveling 55 mph on the well-maintained, eight-lane, divided highway, said the visibility obscurement was immediate and unexpected. Some drivers slowed their vehicles partially as they entered the fogbank and others did not. A tractor-trailer combination vehicle braked suddenly to avoid a small car that changed lanes in front of it, and a pickup truck struck the trailer from the rear. This initiated a chain of collisions that involved at least 24 vehicles over a period of 5 to 10 minutes within a distance of 450 feet and resulted in 7 fatalities, 17 injuries, and extensive damage to all vehicles. The National Transportation Safety Board determines that the probable cause of this multiple-vehicle accident was the failure of the drivers of many of the vehicles involved to reduce speed as necessary to be able to stop in distances compatible with visibility which was severely restricted by dense fog. The initial collision occurred when a tractor-trailer was rear-ended after its driver braked abruptly to avoid hitting an unidentified car which changed lanes immediately in front of the truck. Contributing to the severity of the consequences was the extremely varied sizes and weights of the vehicles in the collisions.

National Transportation Safety Board NTSB-HAR-81-2, HS-032 522, June 1981, 38p, 13 Fig., 1 Tab., 4 App.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: NTIS

PB81-218869

361365

INFERENCES REGARDING THE BACS OF NON-RESPONDENTS IN THE CANADIAN ROADSIDE SURVEY

This paper addresses the problem of non-respondent bias in roadside surveys and develops a mathematical paradigm relating the absolute and conditional blood alcohol content (BAC) distributions (with response as an argument of conditionality). The implications of this model are evaluated on the basis of various assumptions regarding the probability of response at defined BAC levels, using data from the Canadian National Roadside Survey (CNRS). Accordingly, the objectives of the investigation are twofold: (1) To examine the theoretical relationship between the (obviously known) conditional BAC distribution of BAC-tested drivers (respondents), and the absolute (unknown) BAC distribution of drivers in the population at large (respondents non-respondents); and (2) To evaluate that theoretical framework on the basis of various assumptions regarding the probability of response at defined BAC levels, using concrete summary data from the CNRS.

Warren, RA Kanneman, K
Traffic Injury Research Foundation of Canada HS-032 532, June 1980, 20p, 3 Fig., 4 Tab., Refs.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: Traffic Injury Research Foundation of Canada, 171 Nepean Street, 6th Floor, Ottawa, Ontario K2P 0B4, Canada

361366

INNOVATIVE BUS DEVELOPED FOR CARRYING AUTISTIC CHILDREN

The need for a new approach in transporting the autistic child has produced a new bus that effectively meets this challenging problem. The autistic child is characterized by severe problems in communication and behavior and an inability to relate to people in a normal manner. The new bus was designed to enable drivers and driver aids to cope with these problems. Among the many unique features of this school bus are individual padded cubicles with footboards to restrict kicking out into the aisle and special driver aid facilities to service the needs of the autistic children in the event of vomiting, defecation or other clean-up work that is required.

School Bus Fleet Vol. 26 No. 2, HS-032 537, Apr. 1981, p 14, 7 Phot.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: Bobit Publishing Company, 2500 Artesia Boulevard, Redondo Beach, California, 90278

361367

AUTOMOBILE INSURANCE LOSSES PERSONAL INJURY PROTECTION COVERAGES. INJURY CLAIM FREQUENCY RESULTS BY SIZE OF CLAIM VANS, PICKUP TRUCKS, AND UTILITY VEHICLES 1977-1980 MODELS

This Highway Loss Data Institute (HLDI) report presents the frequencies of insurance claims for injuries to occupants of 1977, 1978, 1979, and 1980 model year vans, pickup trucks, and utility vehicles. Claim frequency results are shown separately for all medical claims and for those claims in which the medical losses exceeded $250, $500, and $1,000. The principal findings are: (1) In all claim size categories, pickup trucks, as a group, had the lowest claim frequencies; vans had the next lowest, followed by utility vehicles and then passenger cars with the highest; (2) Among the vans, the Volkswagen Kombi/Campmobile had the highest overall claim frequency and the highest frequency of claims exceeding both $250 and $500; all three results were almost 40 percent worse than the all-vehicle results. The Chevrolet G20 Sportvan (3/4T) had the lowest claim frequency in each claim size category; (3) Among the pickup trucks, the Subaru Brat had the worst results; its overall claim frequency was 72 percent worse than the all-vehicle average. The Dodge D-50 and Toyota Standard Bed pickups also had extremely poor results. The GMC C2500/K2500 (3/4T) had the best results with an overall claim frequency that was 32 percent better than the all-vehicle average and frequencies for claims exceeding both $250 and $500 more than 40 percent better than the all-vehicle results; and (4) The variation in the results for utility vehicles was much greater than that for either vans or pickup trucks. The Jeep Cherokee had the lowest overall claim frequency, 22 percent better than the all-vehicle average. Both of the Jeep CJ series had extremely high claim frequencies. The Jeep CJ-5 had by far the worst results; its overall claim frequency was 122 percent worse than the all-vehicle average and the frequencies rose to three times the average for claims with medical costs exceeding $1,000. The frequency of claims exceeding $250, $500, and $1,000 for the Jeep CJ-5 were all higher than those for any other vehicle in this report and were also higher than those for any of the passenger cars reported for the same model years.

Highway Loss Data Institute Res Rpt. HLDI V80-2, HS-032 535, Sept. 1981, 26p, 1 Fig., 6 Tab., 5 App.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: Highway Loss Data Institute, Watergate 600, Washington, D.C., 20037

361368

INSURANCE THEFT LOSSES--VANS, PICKUPS, AND UTILITY VEHICLES. 1979 MODELS

This Highway Loss Data Institute report describes variations in both the frequency and size of insurance theft losses involving 1979 model year vans, pickup trucks, and utility vehicles. Principal findings: (1) Vans, pickups, and utility vehicles had average loss payments per insured vehicle year at least two times higher than that of passenger cars; (2) The average loss payment per theft claim was considerably higher for vans, pickups, and utility vehicles than for passenger cars; (3) The Plymouth Arrow pickup truck had the best overall theft loss experience and the Ford Bronco the worst; (4) The Jeep CJ-5 had the highest theft claim frequency and the Ford Bronco had the highest average loss payment per claim; and (5) The extent to which large claims contributed to the theft loss experience differed by type of vehicle. For example, 23 percent of the claims for utility vehicles exceeded $6,000 but only 14 percent of claims for vans were over $6,000.

Highway Loss Data Institute Res Rpt. HLDI V79-3, HS-032 539, May 1981, 40p, 4 Tab., 5 App.

Acknowledgment: National Highway Traffic Safety Administration
Order From: Highway Loss Data Institute, Watergate 600, Washington, D.C., 20037

361369

INJURY CONTROL

Injuries, the leading cause of death for more than half the span of human life, can be greatly reduced in frequency, severity, and sequelae. To do so, physicians, other health workers, and the public must employ approaches based on science rather than guesswork. Through relationships with patients and the public, and with decision-makers in industry and government, those who understand the issues and scientific concepts involved can contribute effectively to substantial reduction of this huge problem.

Haddon, W, Jr Baker, SP
Insurance Institute for Highway Safety HS-032 536, Mar. 1981, 61p, 5 Fig., 1 Tab., Refs.

This is Chapter 8 in Preventive and Community Medicine, edited by Duncan Clark & Brian MacMahon. Little, Brown & Company, 1981, 109-140.

Acknowledgment: National Highway Traffic Safety Administration
Order From: Insurance Institute for Highway Safety, Watergate 600, Suite 300, Washington, D.C., 20037

361370

METHODS OF PREDICTING PERFORMANCE OF BUMPER ENERGY ABSORBERS IN AUTOMOBILE COLLISIONS

This report sets forth methods for determining the performance of several principal types of energy absorber. Although the types covered have been discussed in terms of applications for automobile energy absorbing bumper systems, they are suitable for other applications as well. Such applications might, for example, include utilization in seat belts, guard rails, steering columns, seat systems, test sled decelerators, landing gears, rail car couplers, elevator snubbers, and other devices needing to absorb energy in a managed fashion. It is hoped that this report will contribute to the development of basic background and analytical tools for those solutions to problems which may arise with respect to the selection and design of suitable energy absorbers for a variety of applications.

Green, RJ
Denver Research Institute Final Rpt. DRI 2581, HS-032 554, May 1973, v.p., Figs., Tabs., 3 App.

Acknowledgment: National Highway Traffic Safety Administration
Order From: Insurance Institute for Highway Safety, Watergate 600, Washington, D.C., 20037

361371

HIGHWAY SAFETY APPURTENANCES

The contents of this record are: (A) Collision Risk Assessment Based on Occupant Flail-Space Model, Jarvis D. Michie; (B) Heavy-Vehicle Tests of Tubular Thrie-Beam Retrofit Bridge Railing, C.E. Kimball, Jr., M.E. Bronstad, and J.D. Michie; (C) Barrel/W-Section Barriers for Construction Zones, Don L. Ivey and Richard Robertson; (D) Methodology For Evaluation of Safety Improvement Alternatives For Utility Poles, Patrick T. McCoy, Richard T. Hsueh, and Edward R. Post; (E) Loads on Bridge Railings (Abridgment), James S. Noel, T.J. Hirsch, C.E. Buth, and A. Arnold; (F) Strength of Fillet Welds in Aluminum Lighting Poles, James S. Noel, C.E. Buth, and T.J. Hirsch; (G) Crash Tests of Light-Post Thrie-Beam Traffic Barriers, James E. Bryden and Kenneth C. Hahn; and (F) SERB: A New High-Performance Self-Restoring Traffic Barrier, M.E. Bronstad, C.E. Kimball, Jr., and C.F. McDevitt.

Transportation Research Record No. 796, HS-032 523, 1981, 56p, Figs., Tabs., Refs.

Acknowledgment: National Highway Traffic Safety Administration
Order From: TRB Publications Off

361372

INFORMATIONAL REPORT: 1979 PROGRESS OF THE CHEMICAL CHARACTERIZATION PANEL OF THE COMPOSITION OF DIESEL EXHAUST PROJECT AND RESULTS OF PARTICULATE EXTRACTION ROUND-ROBIN

The Chemical Characterization Panel has made good progress in its first year: 1) six formal meetings were held the first year; 2) Unregulated Emissions Priorities and a work plan were established; 3) A solvent Extraction Round-Robin Study was completed; 4) An HPLC Round-Robin dealing with the EPA-RTP "B"-peak class separation is in progress; 5) Data on the efficiency of BaP removal was obtained; 6) An informational report on methods of analysis is progressing and should be available about mid-1980; and 7) The Task Force assignments shown in Appendix B will result in an informational report on the methods considered by this panel as the best state-of-the-art for measuring diesel Unregulated Emissions. This report will be used as a focal point for conducting a workshop for users March 2-4, 1981, in Dearborn, Michigan. It is anticipated that most methods will have had sufficient use prior to the meeting.

Coordinating Research Council, Incorporated CRC 516, HS-032 534, Mar. 1980, v.p., 8 Fig., 10 Tab., 9 Ref., 6 App.

Acknowledgment: National Highway Traffic Safety Administration
Order From: Coordinating Research Council, Incorporated, 219 Perimeter Center Parkway, Atlanta, Georgia, 30346

361373

MOTOR VEHICLE INSPECTION/MAINTENANCE PROGRAMS. A CRITICAL REVIEW

This review is divided into two parts. Part I, Characterization of I/M program development, contains discussions of the following topics: mobile sources and air quality; mobile source control strategies; I/M program requirements; geographic coverage; existing I/M programs; cost comparison; and proposed I/M programs. Part II, I/M emission reduction potential, covers these topics: motor vehicle emission control technology; I/M technical study design; pre-emissions controlled and Technology I; short emissions tests; Technology II and I/M; the Portland program; Element I and the warranty; Element II and I/M effectiveness; mechanic training and fuel economy; Technology III and I/M; recent analysis of I/M programs; mobile source methodologies and air quality; I/M impact on CO air quality; and I/M impact on ozone air quality.

Elston, JC *Journal of the Air Pollution Control Association* Vol. 31 No. 5, HS-032 558, May 1981, pp 524-547, 12 Fig., 10 Tab., Refs.

See also HS-032 559, TRIS 361374, MOTOR VEHICLE INSPECTION/MAINTENANCE PROGRAMS. A CRITICAL REVIEW. DISCUSSION PAPERS.

Acknowledgment: National Highway Traffic Safety Administration
Order From: Air Pollution Control Association, P.O. Box 2861, Pittsburgh, Pennsylvania, 15230

361374

MOTOR VEHICLE INSPECTION/MAINTENANCE PROGRAMS. A CRITICAL REVIEW. DISCUSSION PAPERS

Mr. John C. Elston's paper, entitled "Motor Vehicle Inspection/Maintenance Programs--A Critical Review", was published in the May 1981 issue of the Journal of the Air Pollution Control Association (JAPCA) and subsequently presented in summarized form at the 74th Annual Meeting of the Air Pollution Control Association in Philadelphia. Prepared discussions and comments from the floor followed his presentation. These discussions and comments are reproduced here in the September 1981 issue of JAPCA.

Journal of the Air Pollution Control Association Vol. 31 No. 9, HS-032 559, Sept. 1981, p 939, Figs., Tabs., Refs. See also HS-032 558, TRIS 361373, MOTOR VEHICLE INSPECTION/MAINTENANCE PROGRAMS. A CRITICAL REVIEW.

Acknowledgment: National Highway Traffic Safety Administration
Order From: Air Pollution Control Association, P.O. Box 2861, Pittsburgh, Pennsylvania, 15230

361375

MARIJUANA AND DRIVING

This article outlines the converging lines of evidence--data that extend from the research laboratory to highway fatality studies--that link marijuana use to impaired driving skills and performance. Such evidence indicates the need to intensify efforts to prevent a potentially great increase of marijuana-related highway crashes, injuries and fatalities. The need for action on the federal, state and local levels is pointed out.

Dogoloff, LI *Traffic Safety* Vol. 81 No. 3, HS-032 551, May 1981, p 6, 7 Ref.

Acknowledgment National Highway Traffic Safety Administration
Order From National Safety Council, 444 North Michigan Avenue, Chicago, Illinois, 60611

361376

INTERSECTION ACCIDENTS REDUCED FOLLOWING CHANGE IN RUN-RED LAW. NEW INTERSECTION DEFINITION EASES CONVICTIONS OF RED-LIGHT VIOLATORS

This article reports the short-term results achieved in Phoenix, Arizona by changing the run-red-light law, increasing enforcement and informing the public of the change in law through an extensive education campaign. Under the new law a vehicle enters the intersection illegally if it crosses the near side curb extension line when the signal is red.

Lalani, N *Traffic Safety* Vol. 81 No. 3, HS-032 541, May 1981, p 19

Acknowledgment National Highway Traffic Safety Administration
Order From National Safety Council, 444 North Michigan Avenue, Chicago, Illinois, 60611

361377

MOTOR-VEHICLE DEATHS EDGE UPWARD IN 1980

This article reports the National Safety Council's motor vehicle statistics for 1980. Included are statistics on deaths, injuries, costs, travel, death rate, motor vehicle registrations and population. During 1980, deaths increased 1 percent over 1979 and travel decreased about 1 percent from 1979, giving a 2 percent increase in the mileage death rate for 1980. Other statistics are included and discussed under the following categories: factors affecting motor vehicle deaths in 1980; regional changes; urban-rural fatality experience; deaths by type of accident; deaths by age of victim; and state and city experience.

Carraro, B *Traffic Safety* Vol. 81 No. 3, HS-032 557, May 1981, p 20

Acknowledgment National Highway Traffic Safety Administration
Order From National Safety Council, 444 North Michigan Avenue, Chicago, Illinois, 60611

361378

MANAGING TRAFFIC AND SAFETY ENGINEERING WORK

Approximately four years ago, administrators in the Michigan Department of Transportation, Traffic and Safety Division, implemented a Management by Objectives (MBO) approach for its program responsibilities. The division has a staff of 200 scientific, professional, technical, and support personnel whose duties encompass the full range of traffic and safety engineering. At times the work has been extremely frustrating, but some positive benefits are now emerging and the staff are both enthusiastic and optimistic that a good program management system is at hand. This article presents a case study of the Michigan Department of Transportation's experience with this management approach, pointing out that the information gleaned here may be applicable elsewhere, even in smaller city and county organizations.

Orne, DE *ITE Journal* Vol. 51 No. 7, HS-032 549, July 1981, pp 45-50, 1 Fig., 5 Tab.

Acknowledgment National Highway Traffic Safety Administration
Order From Institute of Transportation Engineers, 525 School Street, SW, Suite 410, Washington, D.C., 20024

361379

THE KILLER WE IGNORE: THE DRUNK DRIVER

This article reviews the drinking driver problem, pointing out how current statistics underestimate the extent of the problem. Ideas are then presented on how to reduce the size of the problem. These ideas are centered on the responsibilities of the public, the peace officers, the courts and the legislature.

California Highway Patrolman Vol. 45 No. 5, HS-032 540, July 1981, p 10

Acknowledgment National Highway Traffic Safety Administration
Order From California Association of Highway Patrolmen, P.O. Box 2631, Sacramento, California, 95812

361380

INFANT SAFETY SEAT LOANER PROGRAM: A GUIDE FOR HEALTH PROFESSIONALS IN A HOSPITAL SETTING

This manual provides step by step instructions for planning, designing and implementing a loaner program in a hospital setting. The first section offers procedures specifically for health care professionals who work within the hospital setting and want to set up a loaner program. The second section offers guidance to service groups and hospital personnel who will work cooperatively in establishing and maintaining a loaner program within the hospital setting. Sources for the material in this manual include: NHTSA's "Early Rider Loan a Seat, How to Establish and Operate an Infant and Child Restraint Loan Program"; the Michigan Motor Vehicle Occupant Protection Program's booklet "Loan a Seat for Safety, How to Establish and Operate an Infant and Child Restraint Loan Program"; a series of national workshops on child restraint; and existing programs in Borgess Medical Center, Kalamazoo, Michigan and in the Boston Hospital for Women in Massachusetts. The forms have been developed by the University of North Carolina Highway Safety Research Center based on its experience in setting up and operating an infant car carrier loaner program in Chapel Hill, North Carolina.

Orr, BT Desper, LP Council, FM
North Carolina University HS-032 530, May 1980, v.p., 17 App.
See also HS-032 531, TRIS 361381, INFANT SAFETY SEAT LOANER PROGRAM: A GUIDE FOR SERVICE GROUPS.

Acknowledgment National Highway Traffic Safety Administration
Order From North Carolina University, Highway Safety Research Center, Chapel Hill, North Carolina, 27514

361381

INFANT SAFETY SEAT LOANER PROGRAM: A GUIDE FOR SERVICE GROUPS

This manual provides step by step instructions for planning, designing and implementing a loaner program operated by a civic (service) group aimed at a target population within a given locality. Sources for the material in this manual include: NHTSA's "Early Rider Loan a Seat, How to Establish and Operate an Infant and Child Restraint Loan Program"; the Michigan Motor Vehicle Occupant Protection Program's booklet "Loan a Seat for Safety, How to Establish and Operate an Infant and Child Restraint Loan Program"; and a series of national workshops on child restraint. Many of the forms have been developed by the University of North Carolina Highway Safety Research Center based on its experience in setting up and running an infant car carrier loaner program in Chapel Hill, North Carolina.

Desper, LP Orr, BT Council, FM
North Carolina University HS-032 531, May 1980, v.p., 17 App.
See also HS-032 530, TRIS 361380, INFANT SAFETY SEAT LOANER PROGRAM: A GUIDE FOR HEALTH PROFESSIONALS IN A HOSPITAL SETTING.

Acknowledgment National Highway Traffic Safety Administration
Order From North Carolina University, Highway Safety Research Center, Chapel Hill, North Carolina, 27514

361382

CONCENTRATED TRAFFIC ENFORCEMENT PROGRAM. ILLINOIS STATE POLICE EVALUATION OF THIRD-YEAR PROJECT

An impact evaluation of the third year of a highway safety project was conducted by the Illinois State Police. Concentrated traffic enforcement consists of increasing the enforcement of selected traffic laws on sections of highway that have previously experienced high rates of accidents. The State Police applied this method of traffic enforcement at each of 51 selected locations at times of the day and on days of the week when accidents at these locations occurred most frequently. The duration of the third-year project was from September through December 1979 and from May through June 1980. Traffic accidents at the patrolled locations declined by 35 percent from expected levels. Moreover, accidents decreased 41 percent during those hours when the police were present on patrol. Statewide accidents, however, decreased 20 percent over the same period. Therefore, the minimum net reduction attributable to the project operations was 15 percent. A linear model was developed relating accident changes to enforcement activity. However, it explains only 20 percent of the variation in accident levels. This project was paid for with Federal Highway Safety funds at a cost of $674,442. State police were hired back on their days-off to provide a total of 49,498 hours of extra patrol. Because fewer accidents occurred, approximately $12,350,500 was saved according to the National Safety Council's estimates of costs for accidents. Consequently, the benefits resulting from the concentrated enforcement were calculated to be 18 times greater than the cost of this project.

O'Brien, JP
Illinois Department of Transportation HS-032 526, Sept. 1981, 20p, 3 Tab., 4 App.

Acknowledgment: National Highway Traffic Safety Administration
Order From: Illinois Department of Transportation, Division of Traffic Safety, 2300 South Dirksen Parkway, Springfield, Illinois, 62764

361383

INFLUENCE OF AMBIENT TEMPERATURE AND COLD START ON AUTOMOBILE FUEL CONSUMPTION

Ambient temperature has a significant influence on automobile fuel consumption, both with warmed-up car and during cold start. As a great percentage of all trips made by car covers less than 8-10 km, the cold start fuel consumption is of vital importance for the car owner. However, car manufacturers have during recent years concentrated on lowering the fuel consumption during standardized driving cycles, like CVS, HDC and ECE. These cycles do not take into account cold start or driving at low temperatures, and therefore there is still a lot to be done in this field. The report describes how ambient temperature affects fuel consumption with warmed-up car and during cold start. A formula is presented, that can be used for estimates of the fuel consumption as a function of ambient temperature and trip length after cold start. Finally some possibilities of reducing the cold start fuel consumption are presented.

Odsell, O
National Swedish Road & Traffic Research Institute VTI Rapport 207A, HS-032 529, 1981, 17p, 6 Fig., 9 Ref.

Acknowledgment: National Highway Traffic Safety Administration
Order From: National Swedish Road & Traffic Research Institute, Fack, S-581 01 Linkoeping, Sweden

361384

LEFT TURN ON RED

After reviewing overseas experience with left-turn-on-red (or its equivalent), the discussion centres on the likely effects of implementing left-turn-on-red on traffic delay, fuel consumption, safety and other factors. The need for legislative changes and new traffic signs is also discussed. Feasibility criteria, based largely on U.S. recommendations, have been devised and are described, along with the results of applying them to intersections in Takapuna City. It is concluded that more detailed studies and field trials, to evaluate left-turn-on-red in New Zealand, are necessary.

Green, FS
National Roads Board, New Zealand RRU Bulletin 49, HS-032 544, 1980, 62p, 2 Fig., 28 Ref., 5 App.

Acknowledgment: National Highway Traffic Safety Administration
Order From: National Roads Board, New Zealand, Road Research Unit, Wellington, New Zealand

361385

LIFESTYLE IMPACT OF CHANGES IN REAL TRANSPORT COSTS

Transport is a vital and integral part of our lives, but exists to enable us to engage in activities (such as work, shopping, personal business and recreation) which are at different locations. The budget of time and money available to people has to be split between many competing activities. The way in which people decide to do this is a function of their lifestyle. This paper looks at how it occurs, and from this takes a cautious look at the future. The balance between vehicle usage and ownership costs is slowly changing to favour operating costs, but the overall fraction of family expenditure devoted to private vehicles has stayed stable through a tripling of fuel costs. The overall allocation of time to travel appears to be stable across all income groups, and the income distributions of some widely different types of households show close similarities at each level of car ownership. The conclusion is that the diversity of time and expenditure balances already being made cover a far wider range of responses than would be introduced by substantial further fuel cost increases--even in real terms.

Wigan, MR
Australian Road Research Board AIR 380-1, HS-032 547, Mar. 1981, 22p, 11 Fig., 4 Tab., Refs.
Project 380, Vehicle Ownership and Use.

Acknowledgment: National Highway Traffic Safety Administration
Order From: Australian Road Research Board, P.O. Box 156, Bag 4, Nunawading, Victoria 3131, Australia

361386

MANDATORY SEAT BELT USAGE: THE FRENCH EXPERIENCE 1973-1981

On July 1, 1973, seat belt use became mandatory in France, making it the first European country to use equipment which was subsequently to become an integral element of any rational road safety policy. The legislation was initially limited only to traffic outside the large centers, but as of October 1, 1979, seat belt use was expanded to cover city driving as well. This paper discusses the step-by-step approach to implement mandatory seat belt usage measures in France.

Gerondeau, C *AAAM Quarterly Journal* Vol. 3 No. 3, HS-032 550, July 1981, pp 25-30, 1 Tab.

Acknowledgment: National Highway Traffic Safety Administration
Order From: American Association for Automotive Medicine, P.O. Box 222, Morton Grove, Illinois, 60053

361387

MOTOR VEHICLE OCCUPANT KINEMATICS AND INJURY PATTERNS

Understanding the kinematics of the motor vehicle occupant during collision assists in analyzing the deceleration and compression forces created on collision and permits an efficient approach to modifying the forces that lead to human tissue injury. Engineering research and developments can provide the standards for improving the hardware and environment, but must rely upon the medical experts as involved partners in the early planning stage of vehicle and roadway design so that modifications in human tissue injury are inherent in our overall transportation system.

McSwain, NE, Jr (Tulane University) *AAAM Quarterly Journal* Vol. 3 No. 3, HS-032 560, July 1981, pp 31-33

Acknowledgment: National Highway Traffic Safety Administration
Order From: American Association for Automotive Medicine, P.O. Box 222, Morton Grove, Illinois, 60053

361388

1979 ROADSIDE VEHICLE INSPECTIONS

This report is a compilation of the results of the Bureau of Motor Carrier Safety's roadside vehicle inspection activities conducted at various locations throughout the country during calendar year 1979. The safety inspection of vehicles and drivers, conducted during periods when actual highway transportation operations are underway, is one of the activities of the Federal Highway Administration's Bureau of Motor Carrier Safety intended to increase the safety of interstate commercial motor vehicle transportation on the Nation's highways. The Federal Motor Carrier Safety Regulations (FMCSR) and the Hazardous Materials Regulations (HMR) are applicable to the transportation operations of motor carriers of passengers or property engaged in interstate or foreign commerce. The Regulations are designed to promote public safety by minimizing the risks associated with these transportation operations and thus contribute to efforts to reduce highway accidents.

Federal Highway Administration HS-032 553, June 1980, 20p, 8 Tab., 1 Phot.

Acknowledgment: National Highway Traffic Safety Administration
Order From: Federal Highway Administration, Bureau of Motor Carrier Safety, Washington, D.C., 20590

361389

MODELING OF VEHICULAR ACCIDENTS

The accurate modeling of motor vehicle accidents is theoretically possible and practical. Through modeling, actual collisions can be reconstructed and reenacted numerous times and at nominal expense. Methods of presentation include: (1) multi-image stroboscopy, (2) high speed cinematography, and (3) actual demonstration of the accident in the courtroom. Two methods for modeling the actual damage to the cars are discussed. This approach to accident reconstruction should eliminate many lawsuits, because both plaintiff and defendant can observe a reenactment of a crash, and will further reduce the chances of erroneous judgment.

Christopher, RA (Colorado University, Boulder) Feder, KR (Automotive Specialists) *Journal of Forensic Sciences* Vol. 26 No. 2, HS-032 555, Apr. 1981, pp 424-430, 4 Fig., 8 Ref.

Acknowledgment: National Highway Traffic Safety Administration
Order From: American Society for Testing and Materials, 1916 Race Street, Philadelphia, Pennsylvania, 19103

361481

ON-SIGHT STUDY OF GUIDE SIGNS EFFECTIVENESS

There are precedents for the studies of road signs in terms of their visuality, color and design. There are, however, few precedents for actual study of guide sign effectiveness as route guides. Therefore in this project actual running tests were carried out and also surveys of existing on-sight road sign and recognition psychology, and analysis of road sign benefits conferred on drivers were carried out. Through those surveys several points concerning guide signs have been brought out from the viewpoint of drivers. At the same time several improvement measures for guide signs have been proposed, such as the use of commonly recognized names of streets and systematization by sign of traffic information.

Miyakawa, H Ikeda, Y Kobayashi, M Noguchi, K Ozaki, K *IATSS Research* Vol. 5 HS-032 571, 1981, pp 16-26, 10 Fig., 2 Tab., 2 Ref.

Acknowledgment: National Highway Traffic Safety Administration
Order From: International Association of Traffic & Safety Sci, 6-20, 2-chome, Yaesu, Chuo-ku, Tokyo 104, Japan

361482

REGIONAL CULTURAL CHARACTERISTICS AND DRIVING BEHAVIOR--INDEXING OF SOCIAL SPEED

The main purpose of this paper is to report the survey results concerning people's speed consciousness. The survey was conducted primarily aiming at obtaining data on people's speed consciousness which cannot be obtained from observational data or government-issued statistics. Furthermore this survey was conducted with the purpose of finding a clue to a hypothesis that there is a relationship between increasing trends in social speed and in the number of psychoneurotics, by investigating when and to what extent people tend to be irritable. The survey results affirmed the hypothesis.

Tsujimura, A Nagayama, Y *IATSS Research* Vol. 5 HS-032 598, 1981, pp 27-38, 17 Fig., 7 Tab.

Acknowledgment: National Highway Traffic Safety Administration
Order From: International Association of Traffic & Safety Sci, 6-20, 2-chome, Yaesu, Chuo-ku, Tokyo 104, Japan

361483

THE REAR LIGHTS AND VISUAL REACTION. THE PROCESS OF CLOSE-UP PHENOMENON BETWEEN VEHICLES

Following the last report entitled "The Close-up Phenomenon of Distance between Vehicles at Night," this report will present the results of analytical research concerning the close-up phenomenon process. It is thought that this phenomenon involves complicated interactions among human beings, machines, and the environment. Based on this presumption, this research was conducted concerning the relationship between physical environmental stimulus and physiological visual function, aiming at defining the process of the close-up phenomenon by means of bench tests and application of the test results to actual traffic situations. At the same time a trial was made to compensate for a deficiency in the relation between man and environment through mechanical improvement.

Nakajima, M Suenaga, K Suzumura, A Inami, H *IATSS Research* Vol. 5 HS-032 596, 1981, pp 39-48, 11 Fig., 2 Tab., 1 Ref.

Acknowledgment: National Highway Traffic Safety Administration
Order From: International Association of Traffic & Safety Sci, 6-20, 2-chome, Yaesu, Chuo-ku, Tokyo 104, Japan

361484

DESCRIPTIVE PARAMETERS USED IN ANALYZING THE BRAKING AND HANDLING OF HEAVY TRUCKS. PROPERTIES OF ANTILOCK SYSTEMS--VOLUME 5

This volume is one of a set of five volumes being prepared under support from the Motor Vehicle Manufacturers Association. The set of volumes is entitled "Descriptive Parameters Used in Analyzing the Braking and Handling of Heavy Trucks." The volumes address the acquisition of data on (1) steering and suspension systems, (2) inertial properties, (3) tires, (4) brakes, and (5) antilock systems. In this volume, results of laboratory tests performed on five commercial air brake antilock systems are discussed. A hybrid computer has been used to simulate wheel dynamics and to control test sequencing. Test results for each system under a variety of simulated test conditions have been digitized and stored on magnetic tape.

MacAdam, CC Fancher, PS
Highway Safety Research Institute, Motor Vehicle Manufacturers Assn of the U.S., Inc Final Rpt. UM-HSRI-81-19-5, HS-032 593, May 1981, 89p, Figs., Tabs., 2 Ref., 2 App.
Contract

MVMA Proj. 1196

Acknowledgment: National Highway Traffic Safety Administration
Order From: Highway Safety Research Institute, Huron Parkway and Baxter Road, Ann Arbor, Michigan, 48109

361485

PRELIMINARY TESTING OF TECHNIQUES TO IMPROVE DRIVING PERFORMANCE OF PERSONS WITH BRAIN DAMAGE VIA PERCEPTUAL/COGNITIVE TRAINING

This interim report documents preliminary investigations on the modifiability of driving-related perceptual/cognitive skills in persons with brain damage. The first part of the report critically reviews past research on remediation of perceptual/cognitive deficits in adults with brain damage; the second part describes the methods, findings, and implications of a pilot experiment on modifiability of driving performance of persons with brain damage via retraining of their perceptual/cognitive skills. The literature review showed that the systematic study of rehabilitation of perceptual and cognitive deficits in adults with brain damage is in its infancy. Frequently, articles offer suggestions for therapy without adopting an experimental approach to assess its effectiveness, or present only case studies as opposed to well-controlled experiments. Reassuringly, however, the few well-controlled experiments suggest that perceptual/cognitive deficits of persons with brain damage might be amenable to improvement via training. The results of the pilot experiment indicate that laboratory training sessions designed to improve underlying perceptual/cognitive skills had a substantial effect on subsequent driving performance. The magnitude of the driving-performance improvement was comparable to that obtained by laboratory training sessions designed to directly foster improvements in driving performance. These findings are discussed and the necessary follow-up research is outlined. If the present preliminary findings are confirmed by a larger study, and the relevant issues (e.g., the optimal training content, training length, durability of the effects, and transfer of the effects) are resolved, the present approach could prove to be a valuable therapeutic method in returning persons with brain damage to the mainstream of society.

Sivak, M Hill, CS Olson, PL Henson, DL
Highway Safety Research Institute, Huron High School, Department of Education Intrm Rpt. UM-HSRI-81-12, HS-032 587, Mar. 1981, 29p, 4 Fig., 2 Tab., Refs.
Contract

23-P-5922115-03/04

Acknowledgment: National Highway Traffic Safety Administration
Order From: Highway Safety Research Institute, Huron Parkway and Baxter Road, Ann Arbor, Michigan, 48109

361486

PROBLEMS IN THE DETECTION AND IDENTIFICATION OF SIGNIFICANT ROADWAY CONDITIONS

To respond effectively to significant roadway conditions, drivers must make timely and accurate detections and identifications. Detection and identification are different processes, and neither is necessarily simple or automatic. This paper discusses both processes; it points out problems with each, and suggests means for improvement.

Olson, PL Sivak, M
Highway Safety Research Institute UM-HSRI-81-46, HS-032 590, Oct. 1981, 14p, Refs.

Acknowledgment: National Highway Traffic Safety Administration
Order From: Highway Safety Research Institute, Huron Parkway and Baxter Road, Ann Arbor, Michigan, 48109

361487

PERFORMANCE SIMULATION AND OPTIMIZATION OF ENGINE-EXHAUST AFTERTREATMENT DEVICES-VEHICLE SYSTEM

The optimization of a three-way-catalyst engine-vehicle system's specifications for maximum fuel economy under the constraints of emission and driveability, has been studied for a small passenger car with a 1.6 liter 4-cylinder engine. A computer was fully utilized to accumulate basic data and research the optimum calibration. As a result, the Automatic Engine Test System (AETS) was developed. The optimum calibration was calculated based on the optimal control theory for an engine-vehicle system with three-way catalyst, and was employed in an actual vehicle by an engine controller in which a 16-bit microprocessor was used. The results showed good agreement.

Inoue, T Nakanishi, K Matsushita, S Koganemaru, S Ooshika, H *JSAE Review* No. 4, HS-032 582, Mar. 1981, pp 15-24, 11 Fig., 5 Tab., 8 Ref.

Acknowledgment: National Highway Traffic Safety Administration
Order From: Society of Automotive Engineers of Japan, Inc. 10-2 Goban-cho, Chiyoda-ku, Tokyo 102, Japan

361488

RELATION BETWEEN GAS FLOW PATTERN AND HEAT FLUX ON PISTON CROWN SURFACE

The relation between gas flow and heat flux on the piston crown surface of the pre-combustion type diesel engine was investigated. The gas flow, the collision position of the jet and the direction of flow from the orifice of the precombustion chamber on the piston crown surface were observed by means of the oil film method. At the same time, the heat flux into the piston surface from the gas was measured. From the above-mentioned result, the relation between gas flow and heat flux was deduced. As a result, it was shown that heat flux (mean and maximum during one cycle) is affected by gas flow and gas temperature which are affected by equivalence ratio (Phi). Qualitatively, the farther it recedes from the collision area of the jet, the less the heat flux grows.

Yoshida, M Harigaya, Y Miyazaki, T *JSAE Review* No. 4, HS-032 600, Mar. 1981, pp 43-51, 18 Fig., 1 Tab., 9 Ref.

Acknowledgment: National Highway Traffic Safety Administration
Order From: Society of Automotive Engineers of Japan, Inc. 10-2 Goban-cho, Chiyoda-ku, Tokyo 102, Japan

361489

PRESENT AND FUTURE OF COUNTERMEASURES FOR NOISE AND VIBRATION PROBLEMS OF SMALL PASSENGER CARS

Since the small passenger car standard was revised in January 1976 by Japanese law, eye-catching new models have been introduced to the market one after another, and small passenger cars have regained their popularity. To reduce their vibration and noise, thus enabling them to run quietly and free of vibration as befitting small-sized popular cars, efforts have been expended to lower engine r.p.m., reduce the vibration of the driving system, and improve the engine mount. As a result, the noise level has been drastically lowered as compared with the earlier small passenger car models. The future problem is to develop a new technology based on a fresh concept to deal with the technical difficulties of meeting the social needs for conservation of resources and energy, and the anticipated stricter control on external vehicular noise and exhaust gas emission while achieving a further reduction of vibration and noise. The most important themes to be dealt with in the future will be the selection of an optimum driving system, the simultaneous reduction of weight and noise, and the development of an efficient means of sound insulation.

Nakano, M Iwase, S *JSAE Review* No. 4, HS-032 588, Mar. 1981, pp 70-79, 14 Fig., 2 Tab., 11 Ref.

Acknowledgment: National Highway Traffic Safety Administration
Order From: Society of Automotive Engineers of Japan, Inc. 10-2 Goban-cho, Chiyoda-ku, Tokyo 102, Japan

361490

PAST AND CURRENT STATUS OF COMPUTER UTILIZATION IN AUTOMOTIVE MANUFACTURING PLANTS

With the increased demand for automobiles, automobile assembly plants have become highly automated, and the concept of flexible automation has started to play an important role in responding to the wide-ranging and varied requests of users since the end of 1970's. Mini-computers have been introduced in makers' testing and evaluation departments since the 1970's and applied to the automobile assembly process as well, to enable to take advantage of flexible automation. Since then, a large number of PLC's (Programmable Logic Controller) and Micro-computers have been introduced into the assembly process and lines keeping pace with the increase in reliability and reduction of costs. In this paper, we explain in brief the history of the introduction and the problems of Mini-and Micro-computers and PLC focusing on application examples in each assembly process.

Kozawa, K Kuroiwa, S *JSAE Review* No. 4, HS-032 577, Mar. 1981, pp 120-129, 15 Fig., 2 Tab.

Acknowledgment: National Highway Traffic Safety Administration
Order From: Society of Automotive Engineers of Japan, Inc. 10-2 Goban-cho, Chiyoda-ku, Tokyo 102, Japan

361491

A PASSENGER CAR DIESEL ENGINE FOR AMERICA

This paper describes the conversion of the 3.6 l (225 in) Chrysler gasoline engine to diesel operation for use in passenger cars. The requirements for an acceptable passenger car diesel engine are discussed and design modifications necessary to ensure these are described. The modified engine was subjected to a detailed development programme resulting in a performance approaching that of the single carburettor gasoline engine together with the expected improvement in vehicle fuel economy and adequate mechanical durability. Reduction of gaseous emissions was investigated and the resulting demonstration vehicles proved very acceptable, and deserving of further development towards production.

Scott, WM (Ricardo Consulting Engineers Limited) *Institution of Mechanical Engineers Proceedings* Vol. 195 HS-032 576, Mar. 1981, pp 1-10, 15 Fig., 4 Ref., 1 App.

Acknowledgment: National Highway Traffic Safety Administration
Order From: Mechanical Engineering Publications Limited, Box 24, Northgate Avenue, Bury St. Edmunds, Suffolk 1P32 6PW, England

361492

MOVING RADAR: AN ASSESSMENT OF ITS ROLE IN TRAFFIC LAW ENFORCEMENT

Police use of moving radar as a tool for enforcing the speed limit is increasing. At the same time, this equipment has come under criticism by a few courts and those persons opposed to any police use of doppler radar. There have been evaluations of the accuracy of moving radar, but none have addressed its effectiveness as well as its cost of operation. These aspects are addressed in this report.

Raub, RA
Illinois Department of Law Enforcement HS-032 566, Sept. 1981, 118p, 5 Fig., Tabs., 3 App.

Acknowledgment: National Highway Traffic Safety Administration
Order From: Illinois Department of Law Enforcement, Bureau of Planning and Development, Springfield, Illinois

361493

1979 ACCIDENTS OF MOTOR CARRIERS OF PASSENGERS

This publication contains a compilation of accident reports furnished directly to the Federal Highway Administration's Bureau of Motor Carrier Safety (BMCS) by motor carriers of passengers operating in interstate or foreign commerce. Any accident that results in death, personal injury, or property damage of $2,000 or more must be reported by the motor carrier. The accident reports have proven to be a vital source of information upon which BMCS relies in administering its regulatory program. The data from the reports are analyzed to determine accident causal factors, identify trends, and measure safety performance. The information gained from the analysis is valuable in the determination of means to reduce accidents, formulation of program requirements, and modification of safety regulations to better protect drivers and passengers of buses as well as other highway users. This publication contains statistical data relating to fatalities, injuries, property damage, and type of accident. These data have been compiled from 719 accident reports filed by motor carriers of passengers during the calendar year 1979.

Federal Highway Administration HS-032 567, 1979, 26p, 2 Tab.

Acknowledgment: National Highway Traffic Safety Administration
Order From: Federal Highway Administration, Bureau of Motor Carrier Safety, Washington, D.C., 20590

361494

POLICY OPTIONS FOR REDUCING THE MOTOR VEHICLE CRASH INJURY COST BURDEN

Following an examination of the cost burden of motor vehicle crash injuries, this report discusses various countermeasure approaches. It identifies known opportunities for reducing crash injuries by influencing drivers, motor vehicles, and roadways. It concludes that: "Effective approaches to achieving large reductions in deaths and injuries have been at hand for years-- energy-managing roadside structures, safety belts, child restraints, air bags, and motorcycle helmets. Yet a combination of resistance to technological innovation and government aimlessness has left these approaches largely unavailable or underutilized. Facing up to the technological omissions means putting available lifesaving approaches and technologies into place and into the fullest use as soon as possible. This course of action must be a central emphasis in any adequate program to reduce deaths and injuries--and their costs--now coming from the nation's highways."

Insurance Institute for Highway Safety HS-032 583, May 1981, 18p, 2 Tab.

ACKNOWLEDGMENT National Highway Traffic Safety Administration
ORDER FROM Insurance Institute for Highway Safety, Watergate 600, Washington, D.C., 20037

361495

THE PRIVATE AUTOMOBILE IN CANADA--THE ENERGY GUZZLER

The initiatives that have been implemented in Canada to stimulate gasoline conservation are of three types: automobile fuel efficiency standards, gasoline price increases, and information programs to stimulate voluntary consumer efforts. The extent to which each of these is having an impact can be determined by answering these questions: What has been the impact of the voluntary standards for automobile fuel efficiency established by the federal government? Have higher gasoline prices had an impact on the driving habits (and maintenance practices) of Canadian drivers? Have advertising campaigns and information booklets had an impact on household driving patterns? Since answers to these questions must be based not only on statistics regarding aggregate gasoline consumption levels, but also on an understanding of consumer life styles, a major research effort was devoted to studying automobile gasoline usage and other aspects of household energy consumption. The purpose of this paper is to discuss the gasoline-related findings of this 3-year research effort while considering the three questions above.

Claxton, JD McDougall, GHG (Wilfred Laurier University) Ritchie, JRB (Calgary University, Canada) *Logistics and Transportation Review* Vol. 17 No. 3, HS-032 589, June 1981, pp 221-229, 2 Tab., 8 Ref.

ACKNOWLEDGMENT National Highway Traffic Safety Administration
ORDER FROM British Columbia University, Canada, Faculty of Commerce, Vancouver V6T 1W5, British Columbia, Canada

361496

P.I.T. STOP: NOVEL INSERVICE TRAINING FOR DRIVERS

A new training program is helping school bus drivers and administrators deal with two traditional problem areas: discipline and communication. This inservice program, referred to as Personnel Inservice Training (P.I.T. Stop), includes the central office, the principal's office, the classroom and the transportation department. The problems experienced by each of these sectors are organized into specific problem statements. For each problem, activities are suggested which might ease the problem. Costs in terms of time and money are minimal.

School Bus Fleet Vol. 26 No. 2, HS-032 573, Apr. 1981, p 36, 3 Phot.

ACKNOWLEDGMENT National Highway Traffic Safety Administration
ORDER FROM Bobit Publishing Company, 2500 Artesia Boulevard, Redondo Beach, California, 90278

361497

PROPER REPORTING OF ACCIDENTS VITAL TO SAFER BUS OPERATIONS

The New Castle County School District (NCCSD) is taking serious aim at reducing school bus accidents. This article discusses the immediate and long-range remedial actions which the NCCSD is taking. They include such things as a more thorough screening of bus driver applicants, more timely and decisive action in dealing with poor driver performance, reporting of all accidents involving district-operated buses that result in any property damage or injury or fatality, monthly bus inspection, and behind-the-wheel and on-the-road training for all school bus drivers by the Delaware State Department of Public Instruction.

School Bus Fleet Vol. 26 No. 2, HS-032 592, Apr. 1981, pp 43-44

ACKNOWLEDGMENT National Highway Traffic Safety Administration
ORDER FROM Bobit Publishing Company, 2500 Artesia Boulevard, Redondo Beach, California, 90278

361498

THE MECHANIC WILL SEE YOU NOW

This article foresees an auto repair boom as cars get older, and there is no longer a gas station on every street corner. While the auto population has grown from 100 million to 130 million in the last decade, and the average age of these vehicles has risen to seven years, at least 56,000 service stations and new car dealers have closed their doors in the same period. Space and the need for hands-on management have traditionally made fixing cars a decentralized and entrepreneurial industry. Now, gasoline stations and tire dealers are more repair-oriented to compensate for reduced profits in their retail activities. Franchises and chain operations are increasing, but today much of the service business is too demanding for corporations to manage, and too capital-intensive for aspiring small businessmen to enter.

Lappen, AA *Forbes* HS-032 569, Apr. 1981, p 90, 1 Phot.

ACKNOWLEDGMENT National Highway Traffic Safety Administration
ORDER FROM Forbes Incorporated, 60 Fifth Avenue, New York, New York, 10011

361499

RADIAL TRUCK TIRE INFLATION ANALYSIS: THEORY AND EXPERIMENT

The finite element method is a useful tool in the design process to give deformations, strains and stresses in tires when they are loaded. To show this, a geometrically nonlinear, materially homogeneous, and generally orthotropic finite element model is described and used in the inflation analysis of radial truck tires. The element, a linear strain axisymmetric triangle, has three displacement degrees of freedom at each mode in order to correctly model the three-dimensional states of strain and stress present in generally orthotropic structures. Two radial truck tires, a tube-type 10.00R20 and a tubeless 11R22.5, are analyzed both experimentally and analytically for inflation loading. Experimentally, cord forces are measured by cord force transducers, belt edge interply shear strain is measured by a pin rotation technique, sidewall growth is measured by a laser profilometer, and sidewall strains are measured with liquid metal strain gages. These values are compared with those predicted by the finite element model. The model works well for the tube-type 10.00R20 tire and above the mid-sidewall of the tubeless 11R22.5 tire. Further work needs to be done on the lower sidewall and bead area portions of the 11R22.5 tire model. The finite element model and solution procedure for the 11R22.5 radial truck tire is used for current designs. trend predictions. Several tire construction features, belt bias angle, belt end count, body ply end count, and belt skim stock modulus are varied, and their effect on inflation growth, strains and cord forces are predicted. The largest effect on inflation behavior was variation of the belt bias angle. The other features had minor effects. These predicted trends are important in giving the design engineer direction in creating new tire types or modifying current designs.

Kennedy, RH Patel, HP McMinn, MS (Firestone Tire and Rubber Company) *Rubber Chemistry and Technology* Vol. 54 No. 4, HS-032 594, Sept. 1981, pp 751-766, 15 Fig., 1 Tab., 17 Ref.

ACKNOWLEDGMENT National Highway Traffic Safety Administration
ORDER FROM American Chemical Society, Rubber Division, University of Akron, Akron, Ohio, 44325

361500

MOTOR VEHICLE THEFT LAW ENFORCEMENT ACT OF 1981 INTRODUCED

This article summarizes the Motor Vehicle Theft Law Enforcement Act of 1981 (HR4325), sponsored by Representative S. William Green (R-NY) and others. The act provides for the identification of new motor vehicles, trucks, motorcycles, their parts, and their components. The alteration of such identification and other activities related to such identified units, would become federal crimes, as would the export of any stolen self-propelled vehicle, knowing that its identification number has been tampered with. The bill would create Task Forces to report on the theft of off-highway mobile equipment (farm and construction equipment) and to report on state motor vehicle titling programs. Rep. Green indicates that law enforcement, the insurance industry, and consumers agree that this act would serve to create standards which would provide law enforcement agencies with the tools needed to help battle theft on an interstate and international level.

NATB Journal HS-032 561, 1981, p 1

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: National Automobile Theft Bureau, 10330 South Roberts Road, Palos Hills, Illinois, 60482

361501

PARANOID OR PROTECTED? NOBODY WOULD STEAL MY BIKE...WOULD THEY?

This article, the first of two parts, discusses the motorcycle theft problem. Approximately 100,000 bikes are stolen annually. Nationally, the recovery rate for stolen motorcycles is only 9 percent, against 60 to 70 percent for automobiles. The article presents an example of insurance economics that shows both owners and insurers lose when a motorcycle is stolen. It describes through direct quotes, the precautions taken both by victims, and by luckier motorcycle owners who have not yet been victimized. Motorcycle owners' false assumptions and unwise practices are discussed at length. The extreme protective measures taken by some owners are also described.

Harrison, G *American Motorcyclist* Vol. 45 No. 10, HS-032 574, Oct. 1981, pp 17-20, 3 Phots.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: American Motorcyclist Association, P.O. Box 141, Westerville, Ohio, 43081

361502

AM INTERVIEW: RAY PECK--NHTSA'S NEW ADMINISTRATOR SHARES HIS VIEWS ON THE AGENCY'S GOALS AND ON MOTORCYCLE SAFETY

In this interview, Ray Peck, Administrator, National Highway Traffic Safety Administration (NHTSA), shares his views on the agency's goals and on motorcycle safety. The purpose of the interview was to try to learn a bit about the man and his personal opinions, but, more importantly, his feelings about the proper role NHTSA can, and should play, in motorcycle safety. The interviewer indicates that Mr. Peck stresses the subject of driver and rider behaviour on the highway, rather than seeking out technological breakthroughs in prevention of accidents, or in prevention of injuries, once accidents have occurred.

American Motorcyclist Vol. 36 No. 11, HS-032 595, Nov. 1981, pp 15-18, 5 Phot.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: American Motorcyclist Association, P.O. Box 141, Westerville, Ohio, 43081

361503

MOTORIZED BIKES AND MOPEDS

This article evaluates motorized bikes and mopeds separately. The motorized bikes include add-on kits and complete units; both types are further subdivided between gasoline and electric drive. The ratings evaluate these different types in one overall table. The mopeds tested all had 50 cc two-stroke engines. Consumers Union-considers both types of two-wheeled vehicles suited only for non-urban areas, where traffic is light and relatively slow, or for planned communities, college campuses and retirement complexes with little or no traffic. A separate evaluation is included for a 72 cc vehicle which is in legal limbo. It looks like a moped, but exceeds the 50 cc engine size and 30 mph top speed limit which would allow it to be registered as one. But it is too small, too light, and too slow to be taken seriously by most motorcycle buffs. This unit is far superior in performance to any of the mopeds tested, according to Consumers Union.

Consumer Reports Vol. 46 No. 5, HS-032 565, May 1981, pp 261-266, 4 Phots.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: Consumers Union of U.S., Incorporated, 256 Washington Street, Mount Vernon, New York, 10550

361504

MOTORCYCLES FOR BEGINNERS

This article evaluates five light, small-engined motorcycles, which might interest first-time riders who want to get around without a car. A previous article (May 1981), covers motorized bikes and mopeds. Two motor scooters were also evaluated, along with the small motorcycles for this article and are discussed in a separate box. Another box describes how to ride a motorcycle and survive. Four of the motorcycles tested had engines ranging from 125 to 250 cc. The fifth had a 400 cc engine. The article also recommends that the novice consider a 70 cc engine vehicle, which is bigger than a moped, but smaller than a motorcycle and was originally reported on in the May 1981 article.

Consumer Reports Vol. 46 No. 6, HS-032 564, June 1981, pp 352-357, 4 Phot.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: Consumers Union of U.S., Incorporated, 256 Washington Street, Mount Vernon, New York, 10550

361505

MOTORCYCLE HELMETS

This report evaluates both full-face (full facial coverage) and three quarter (full-coverage) motorcycle helmets. It cites a University of Southern California study of motorcycle helmets that discovered that expensive helmets did not prove significantly better than "cheap" ones in traffic accidents. Consumers Union believes full-face helmets offer considerable extra facial protection. Additional information is presented in two boxes that accompany the article. The first, Decoding the Safety labeling on helmets-discusses the three sets of standards currently used: U.S. Department of Transportation (DOT), American National Standards Institute (ANSI), and Snell Memorial Foundation. The second box-The attack on helmet laws-describes the ups and downs of mandatory helmet laws, and cites statistics which show that during the period (1966-1976) when they were being introduced, the fatality rate among motorcyclists declined from 12.8 to 6.5 deaths per 10,000 registered motorcycles. From 1976, when the Highway Safety Act stripped the Transportation Secretary of the right to refuse funding to states that did not require the wearing of helmets, the fatality rate rose to 8.9 per 10,000 in 1979. Ratings of motorcycle helmets are also included.

Consumer Reports Vol. 46 No. 6, HS-032 562, June 1981, pp 358-362

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: Consumers Union of U.S., Incorporated, 256 Washington Street, Mount Vernon, New York, 10550

361506

1977 CRC EXPLORATORY PROGRAM TO INVESTIGATE THE EFFECT OF DRIVEABILITY ON COLD START FUEL ECONOMY

Recent legislation has emphasized increased vehicle fuel economy and lower RVP (Reid Vapor Pressure) limits on fuels. As a result, there is some concern within the industry that poor driveability performance during cold start and driveaway has a significant influence on fuel economy. In 1977, the Coordinating Research Council, Inc. conducted an exploratory program to investigate the effect of driveability performance on cold start fuel economy in the intermediate temperature range of 40 deg-60 deg F. In previous CRC intermediate temperature driveability programs, an acceptable test procedure for establishing relationships between various fuel volatility parameters and vehicle driveability was developed. In view of the CRC-Motor Volatility Group's extensive experience with this test procedure, it was decided to modify it to also include the capability of measuring fuel consumption. The objective of this program was to investigate possible changes in cold start fuel economy as influenced by driveability performance. The various test phases in this program included the measurement of fuel consumption using the modified CRC Cold Start and Driveaway Procedure from a cold start (overnight soak), and the repeat of this test with the vehicle fully warmed up. Data from the warmedup cycle were used to investigate a correction factor for the effect of fuel differences on cold start fuel economy. Fuel economy tests were also made using the SAE J1082 Fuel Economy Urban Cycle Test Procedure. The Urban Cycle schedule is a typical slow speed, stop-and-go driving cycle, with a warmed-up vehicle, and is representative of the type of driving that a consumer would encounter in the city. In addition, a selected number of cars were run on the EPA Federal Test Procedure (FTP) Urban Driving Schedule. All tests, except those using the EPA Federal Test Procedure Urban Driving Cycle, were conducted on the road using selected test cars and the same fuels from the previous 1976 CRC Intermediate Temperature Driveability Program. EPA Federal Test Procedure Urban Driving Cycle tests were conducted on a chassis dynamometer by an independent contractor. Six companies supplied equipment and twelve companies participated in this program as shown in Appendix A. Members of the CRC Program Panel and Analysis Panel are listed in Appendix B.

Coordinating Research Council, Incorporated CRC 518, HS-032 568, June 1980, v.p., 5 Fig., 19 Tab., 11 App.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: Coordinating Research Council, Incorporated, 219 Perimeter Center Parkway, Atlanta, Georgia, 30346

361507

PEDAL CYCLE BRAKING PERFORMANCE--EFFECTS OF BRAKE BLOCK AND RIM DESIGN

Many pedal cyclists know that the wet weather braking performance of rim brakes employing rubber brake blocks and chromed steel rims is inadequate. Road tests were conducted to find combinations of brake block material and rim types which provided adequate braking in the wet and dry. Nine brake block sets were tested; these included rubber, synthetic and leather blocks. The rims tested were plain, dimpled and grooved chromed steel and plain light alloy. The bicycle used for comparative tests was equipped with a water reservoir and jets to each rim so the water application rate could be controlled. The loads applied on the brake levers were controlled by adjustable stops on the handlebars. Results are given for rubber, synthetic and leather blocks on chromed steel and on light alloy rims in both wet and dry conditions. It is noted that dimpled and grooved rims do not significantly improve wet braking performance over that for plain steel rims. Leather blocks were shown to be suitable in all the test conditions, while synthetic blocks were suitable only for light alloy rims. Some rubber blocks appeared to be suitable only for light alloy rims, but others were not. All the rubber blocks tested gave very long stopping distances in the wet on chromed steel rims.

Watts, GR

Transport and Road Research Laboratory SR 619, HS-032 579, 1980, 16p, 4 Fig., 4 Tab., 7 Ref., 1 App.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: TRRL

361508

PREDICTION OF BLOOD ALCOHOL CONCENTRATIONS IN HUMAN SUBJECTS. UPDATING THE WIDMARK EQUATION

Equations are derived for expressing the relationship between alcohol intake and blood alcohol concentration in terms of total body water and the blood water fraction. These equations are more exact than Widmark's, and if used in conjunction with regression equations to calculate total body water, will give more accurate predictions of BAC.

Watson, PE Watson, ID Batt, RD *Journal of Studies on Alcohol* Vol. 42 No. 7, HS-032 585, July 1981, pp 547-556, 2 Fig., 16 Ref.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: Rutgers University, New Brunswick, Rutgers Center of Alcohol Studies, Publication Division, New Brunswick, New Jersey, 08903

361509

THE PROFITABILITY OF CONSUMER PROTECTION: WARRANTY POLICY IN THE AUTO INDUSTRY

This study uses data collected in a detailed survey of Wisconsin buyers to analyze the failure of the American automobile industry to improve warranty protection. The present level of warranty performance apparently reflects a strategic choice, conscious or unconscious, to maintain continuing relationships with customers through a reliance on the proprietary control over the market, rather than through investments in goodwill assets. Three possible explanations for this choice are explored. The first explanation, that the development of goodwill assets is not profitable because there is no effective demand for better warranty protection, is examined and rejected. The second explanation, that the development of goodwill assets is not profitable because the costs of adequate warranty protection would be too great, is also examined and rejected. The third explanation, that decision making is biased against the development of goodwill assets because of exclusive reliance on short-term accounting systems, is supported by data obtained in the consumer survey and by data obtained through interviews with industry professionals. The methodology used in this study is intended to serve as a rough model for a goodwill accounting system.

McNeil, K Miller, RE *Administrative Science Quarterly* Vol. 25 HS-032 591, Sept. 1980, pp 407-427, 1 Fig., 6 Tab., Refs.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: Cornell University, Graduate School of Business and Public Administration, Ithaca, New York, 14853

361510

A NOTE ON PATTERNS OF WEAR WITHIN THE TREAD AREA

Tread wear data are frequently fitted by a straight line having average groove depth as the ordinate and mileage as the abscissa. The authors have observed that the data points are not randomly scattered about the line but exist in runs of six or seven points above the line followed by the same number below the line. Attempts to correlate these cyclic deviations with climatic data failed. Harmonic content analysis of the data for each individual groove showed strong periodic behavior. Groove 1, a shoulder groove, had two important frequencies at 40,960 and 20,480 km (25,600 and 12,800 miles); Grooves 2 and 3, the inside grooves, had important frequencies at 10,240, 13,760, and 20,480 km (6400,8600, and 12,800 miles), with Groove 4 being similar. A hypothesis is offered as a possible explanation for the phenomenon.

Brenner, FC (National Highway Traffic Safety Administration) Kondo, A (Department of Energy) *Tire Science and Technology* Vol. 7 No. 1-2, HS-032 570, Jan. 1979, pp 3-13, 7 Fig., 3 Tab., 1 Ref.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: American Society for Testing and Materials, 1916 Race Street, Philadelphia, Pennsylvania, 19103

361511

PREDICTION OF TIRE TREAD WEAR RATE AND TREAD WEAR RATE DIFFERENCES

A method is presented for the analysis of tread wear test data, having the principal aim of predicting the ultimate tread life from results of a test suspended near the halfway mark. This method uses standard regression analysis of a suitable model followed by Bayesian inference to produce subjective probability distributions of predicted tread depth and their associated uncertainty.

Dudley, EA Bauer, RF (Dunlop Research Centre) Reilly, PM (Waterloo University, Canada) *Tire Science and Technology* Vol. 7 No. 3-4, HS-032 586, July 1979, pp 43-57, 7 Fig., 2 Tab., 15 Ref.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: American Society for Testing and Materials, 1916 Race Street, Philadelphia, Pennsylvania, 19103

361512

A RELATION BETWEEN COLLISION CLAIM FREQUENCY AND DRIVER AGE DISTRIBUTION IN HLDI DATA

Collision claim frequency data for 1977, 1979 and 1980 modes of 2-door cars with no youthful drivers are studied. For subcompacts, the claim frequencies by make/series increase with the ratio of cars with youthful drivers to those with no youthful drivers for the same make/series.

Joksch, HC (Center for the Environment and Man, Incorporated) *Accident Analysis and Prevention* Vol. 13 No. 2, HS-032 599, June 1981, pp 147-151, 3 Fig., 3 Tab., 2 Ref.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: Pergamon Press Limited, Headington Hill Hall, Oxford OX3 0BW, England

361544

TIRE TREADWEAR VALIDATION. VOLUME 2, SECTION 1, NEVADA TREADWEAR MEASUREMENT TEST DATA

Treadwear measurement test data include accelerated treadwear measurements, convoy measurements, convoy tread profile graphs, convoy most worn groove graphs, and new tire footprints. The tire measurement data sheets provide the following information: tire size, manufacturer and description; rim width and diameter; cold start inflation; tire dimensions (outside diameter, tread radius and arc); and amount of tread remaining in each groove after ten mileage increments.

Nevada Automotive Test Center HS-804 793U, 1978, 421p

Reference copy only available Nevada Automotive Test Center. Volume 2, Section 2-4 are HS-804 794U--HS-804 796U; Volume 3 is HS-804-797U. Contract

DOT-HS-6-01347

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: Nevada Automotive Test Center, Carson City, Nevada

361545

TIRE TREADWEAR VALIDATION. VOLUME 2, SECTION 2, CONNECTICUT TREADWEAR MEASUREMENT TEST DATA

Treadwear measurement test data include accelerated treadwear measurements, convoy measurements, convoy tread profile graphs, and convoy most worn groove graphs. The tire measurement data sheets provide the following information: tire size, manufacturer and description; rim width and diameter; cold start inflation; tire dimensions (outside diameter, tread radius and arc); and amount of tread remaining in each groove after ten mileage increments.

Nevada Automotive Test Center   HS-804 794U, 1978, 470p

Reference copy only available Nevada Automotive Test Center. Volume 2, Section 1 is HS-804 793U; Volume 2, Section 3 is HS-804 795U; Volume 2, Section 4 is HS-804 796U; Volume 3 is HS-804 797U.

Contract

DOT-HS-6-01347

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: Nevada Automotive Test Center, Carson City, Nevada

361546

TIRE TREADWEAR VALIDATION. VOLUME 2, SECTION 3, TEXAS TREADWEAR MEASUREMENT TEST DATA

Treadwear measurement test data include accelerated treadwear measurements, convoy measurements, convoy tread profile graphs, and convoy most worn groove graphs. The tire measurement data sheets provide the following information: tire size, manufacturer and description; rim width and diameter; cold start inflation; tire dimensions (outside diameter, tread radius and arc); and amount of tread remaining in each groove after ten mileage increments.

Nevada Automotive Test Center   HS-804 795U, 1978, 500p

Reference copy only available Nevada Automotive Test Center. Volume 2, Section 1 is HS-804 793U; Volume 2, Section 2 is HS-804 794U; Volume 2, Section 4 is HS-804 796U; Volume 3 is HS-804 797U.

Contract

DOT-HS-6-01347

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: Nevada Automotive Test Center, Carson City, Nevada

361547

TIRE TREADWEAR VALIDATION. VOLUME 2, SECTION 4: PROGRAM SCOPE EXPANSION (NEVADA), TREADWEAR MEASUREMENT TEST DATA

Tire measurement data sheets are presented from convoy testing for tread wear. Data include wheel position; original and accumulated (including wet) mileages; inflation pressure; ambient temperature; outside, crown, and inside diameters, section width; tread radius and arc width; original tread depth for individual grooves; tread remaining; and visual conditions. Tread profile and most worn groove graphs are provided.

Nevada Automotive Test Center   HS-804 796U, 1978, 52p

Reference copy only available Nevada Automotive Test Center. Volume 2, Section 1-3 are HS-804 793U--HS-804 795U; Volume 3 is HS-804 797U.

Contract

DOT-HS-6-01347

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: Nevada Automotive Test Center, Carson City, Nevada

361548

TIRE TREADWEAR VALIDATION. VOLUME 3. INSTRUMENTED SYSTEM DESCRIPTION AND OPERATING PROCEDURES

A system is described for measuring and recording dynamic tire/wheel vertical force (Fv), longitudinal force (FL), side force (Fs), ground speed, and wheel velocities of all wheels, and steering angles of the vehicle's front wheels. The system incorporates four triaxial, strain-gauge type, wheel force transducers, providing outputs proportional to Fv, FL, and Fs of up to four wheel positions. Two resistance potentiometers are used to measure the relative steering angle of the two front wheels. The system calculates, records, and displays longitudinal and side Mu forces and differential interface velocity (DIV) of the four wheels via function modules designed into the electronic portion of the system. Five electronic counters measure and display revolutions of a fifth wheel attached to the test vehicle and of the four vehicle wheels, providing functions of distance traveled and wheel revolutions per unit time or distance traveled. Proximity pulse pickups provide multiple pulses to the counters and to three pulse rate-to-DC converters which provide DC voltage analog to velocity to the DIV function modules. Universal in nature, the system can record and/or display any of 32 of the functions available from the various transducers and/or function modules. The vehicle incorporates a modified brake system that will allow any of the four wheels to be independently locked by the brake or freed of all hydraulic pressure; the vehicle also has locking hubs on front and rear axles, allowing it to be driven in front wheel drive, rear wheel drive, or four wheel drive. An air-assisted shock absorber system enables the driver to control the air pressure in each unit; this allows changing the front and rear spring rates, transfer of vertical load, and maintaining of normal ride heights under heavy vehicle loads. A Dana transfer case allows high or low range operation in all drives, selectable from the driver's position. System calibration procedures, operation, and use for accelerated treadwear evaluations are described. Appendices contain actual photographs of the equipment, calibration data, and calibration graphs.

Nevada Automotive Test Center   HS-804 797U, 1978, 124p

Reference copy only available Nevada Automotive Test Center. Volume 2, Section 1-4 are HS-804 793U--HS-804 796U.

Contract

DOT-HS-6-01347

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: Nevada Automotive Test Center, Carson City, Nevada

361549

NOISE ABATEMENT TECHNIQUES FOR CONSTRUCTION EQUIPMENT

Efforts are described which were aimed at transferring technology developed in the area of truck noise reduction to that of construction equipment. Included is information gathered from previous contracts, surveys of manufacturers, a noise impact ranking by equipment type, engine and equipment test results, specific information to enable equipment owners to reduce noise from their equipment, and recommendations dealing with reasonable noise level goals for used equipment. Comprehensive specifications were compiled for diesel engines greater than 50 hp. used in the construction industry; a comparative muffler selection procedure was developed; and costs were calculated for mufflers and complete exhaust systems. A noise impact ranking was developed to characterize equipment types by degree of noise pollution, based on the average machine noise level, the typical percentage of time the machine was at full load, the average production rate/yr. based on production figures of the last ten yr., and proximity of machine use to human population. Using the noise impact rating system, front-end loaders, tractors, and backhoes (excavators) were identified as the three noisiest machines. Detailed tests conducted on two classes of tractors, a front-end loader and a backhoe, identified the contributions of the various major component noise sources to overall machine noise levels. Results indicate that construction equipment produced since the late 1960's has utilized reasonable muffling so that exhaust noise is not generally the dominant noise source.

Toth, WJ

Society of Automotive Engineers, Incorporated   Final Rpt.
DOT-TSC-NHTSA-79-45, HS-803 293, 1979, 186p, Refs.

Contract

DOT-TSC-915

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: NTIS

PB-300948

361550

RECOGNIZING FRAUDULENT IDENTIFICATION (INSTRUCTOR'S MANUAL FOR TRAINING PERSONNEL WHO ISSUE DRIVER LICENSES)

An instructor's outline is presented for conducting a training course for driver licensing personnel on the recognition of fraudulent identification (ID). The course uses 80 slides; word slides emphasize major points made by the instructor and picture slides illustrate the topics of discussion, with many showing actual documents that were fraudulently altered or prepared. It is suggested that slides be supplemented with locally prepared materials addressing specific documents or identification problems unique to area jurisdictions. Training objectives and notes are provided for each lesson (introduction, scope of the false ID problem, Federal Advisory Com. on False Identification, importance of establishing identity, how to detect false identification, what the examiner should expect, and summary). After completing the course, the trainee should be able to explain the importance of establishing the identity of each applicant for a driver's license, and describe a set of properties which establish ID document validity.

National Highway Traffic Safety Administration HS-803 059, 1978, 26p, 4 Ref.

Prepared in cooperation with Passport Office of State Dept. Accompanying slides located in Audio Visual collection of Technical Reference Division, NHTSA.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: National Highway Traffic Safety Administration, Driver Licensing and Adjudication Div, 400 7th Street, SW, Washington, D.C., 20590

361551

FACTS YOU SHOULD KNOW ABOUT AUTO SAFETY, FUEL ECONOMY AND AUTO REPAIR COSTS WHICH CAN SAVE LIVES, FUEL, AND MONEY

Information is presented to help consumers make informed choices when considering automobile safety, fuel economy, and automobile repair costs. The six most frequent consumer auto repairs involve tires and tubes, wheel balancing, engine tune-ups, engine hose replacement (heater or radiator), V-belt replacement for such equipment as fan belts and power accessories, and brake shoe installation. Consumers lose about 40 cents of each dollar spent on repair and maintenance due to unnecessary repairs caused by inadequate diagnosis, unneeded parts of package deals, faulty repairs for which owners do not get their money back, unneeded repairs sold with possible fraudulent intent, overfrequent preventive maintenance, and vehicle design requiring the use of overly modularized parts or highly nonstandard parts. Recommendations to minimize the consumer auto repair problem concern diagnostic vehicle inspection centers, public education, Federal motor vehicle standards, fair trade practices, complaint arbitration, and consumer cooperatives. Fuel economy standards have been set for passenger cars through model year 1985. Owners of 1985 cars can expect an increase in fuel economy from about 17 to 27.5 mpg and a net savings of about $1540 in the cost of gasoline over a car's life (1979 dollars). Fuel economy standards have also been formulated for light trucks and vans through model year 1981. By 1985, passenger car and light truck fuel economy standards will result in an annual saving of more than 16 billion gallons of gasoline. Traffic accidents cause 139 traffic deaths per day. Although lap and shoulder belts can significantly reduce the chance of a fatality or serious injury in an accident, less than one out of nine Americans uses them while driving. More than half of all fatalities occur at night, and nearly 60% happen in rural accidents. Automatic crash protection in new cars and the Dept. of Transportation's research safety vehicle demonstration are considered as measures for reducing the traffic toll, as well as the effectiveness of the fifty-five mile per hour speed limit. Other highway safety programs are noted, such as alcohol countermeasures, police traffic services, emergency medical services, driver licensing, pedestrian safety, motorcycle safety, occupant protection, and motor vehicle inspection.

National Highway Traffic Safety Administration HS-805 311, No Date, 14p, Refs.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: National Highway Traffic Safety Administration, 400 7th Street, SW, Washington, D.C., 20590

361552

HONDA MOTOR COMPANY'S CVCC ENGINE

From 1968 to 1972, Honda Motor Co. of Japan designed, tested, and massproduced a stratified charge engine, the CVCC, which was lower in carbon monoxide, hydrocarbon, and nitrogen oxide emissions and higher in fuel economy than contemporary conventional engines of similar output. Honda developed the CVCC without government assistance or outside help. Honda's success came at a time when steadily increasing fuel costs and the various provisions of the Clean Air Act had forced U.S. automakers to consider possible alternatives to the conventional gasoline engine. While most major engine manufacturers had investigated some form of stratified charge engine, Honda's CVCC was the only one to find successful market application. This case study examines the circumstances surrounding the development of the CVCC engine and its introduction into the Japanese and American markets.

Abernathy, WJ Ronan, L
Lexington Technology Associates Final Rpt. DOT-TSC-NHTSA-80-3, HS-805 268, 1980, 76p, 62 Ref.
Contract

DOT-TSC-1355

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: National Highway Traffic Safety Administration, 400 7th Street, SW, Washington, D.C., 20590

361553

TRUCKER'S GUIDE TO FUEL SAVINGS

A booklet providing guidelines for the line-haul truck operator on saving fuel contains information developed for the following engine models: 220-and 240-hp, four-stroke, naturally aspirated diesel engines; and 290-and 350-hp, four-stroke, turbocharged diesel engines. The importance of saving fuel and potential cost savings are outlined. Truck movement resistance (rolling, air, and grade) is explained in terms of power required. Approaches to saving fuel are described: engine tuning, increasing payload, reducing truck frontal area, using radial or wide-base single tires, truck streamlining, using a temperature-modulated fan, using single-drive axles, adding turbocharging kits, derating the engine, reducing engine speed, driving slower, and optimizing engine, transmission, and axle. A special note to drivers explains fuel-efficient driving techniques. An example is provided of how much fuel can be saved by applying a combination of methods in stages.

Department of Transportation, Department of Energy, Environmental Protection Agency HS-805 256, 1980, 26p

Originally printed Oct 1973, reprinted by Dept. of Transportation Joint Industry-Government Voluntary Truck and Bus Fuel Economy Improvement Program.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: DOT

361554

INTERNATIONAL AUTOMOTIVE FUEL ECONOMY RESEARCH CONFERENCE (1ST) PROCEEDINGS, WASHINGTON, D.C., OCTOBER 31-NOVEMBER 2, 1979

Following an introduction by the Administrator and Associate Administrator of the National Hwy. Traffic Safety Administration, status reports were presented by government representatives (U.S., Federal Republic of Germany, Japan, Italy, U.K., Canada, Sweden, and France) on energy use and conservation programs in the automotive transportation sector. Fifty technical presentations covered future powertrain concepts, a systems approach to improved fuel economy, diesel engine technology, current spark ignition engines, vehicle design and materials, heavy-duty trucks, the market and the consumer, and improved transmission and hybrid vehicle concepts. Five technical papers are included which were not presented at the conference. These concern hydrogen fuel, automotive energy performance simulation; loading problems with tubular composite structural members; an infinitely variable, infinite ratio automatic transmission; and supercharging. A summary of the conference activities was supplied in a final panel discussion and closing comments. A roster of conference participants is included.

National Highway Traffic Safety Administration HS-805 233, 1980, 541p, Refs.

Includes HS-031 341--HS-031 395.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: GPO

361555

MOTORCYCLE OPERATOR SKILL TEST (MOST 2), USER'S MANUAL

A manual is provided for uses of the Motorcycle Operator Skill Test (MOST 2), designed for use by state agencies to assess license applicants' motorcycle riding skills. The test can be set up in an off-street paved area, such as a parking lot, in an area about 125 ft. x 50 ft., smaller than that required by the original version of MOST. Nine exercises are used in both versions: starting and moving up a hill; sharp turn; accelerating and slowing in a turn; normal stop; turning speed selection; quick stop (straight); obstacle turn; and quick stop (curve). The test course layout and control system are described; applicant processing and examiner training are discussed. Sample field guides located in a back pocket include exercise descriptions, a time/speed/stopping distance chart, a motorcycle skill test score sheet, scoring criteria, and a summary of instructions. MOST 2 was evaluated in an operational licensing program at the California Dept. of Motor Vehicles (Apr 1976-Dec 1978).

Motorcycle Safety Foundation, National Highway Traffic Safety Administration HS-805 183, 1980, 49p, 6 Ref.
Contract

DOT-HS-7-01702

Acknowledgment: National Highway Traffic Safety Administration
Order From: National Highway Traffic Safety Administration, 400 7th Street, SW, Washington, D.C., 20590

361556

RURAL EMS (EMERGENCY MEDICAL SERVICES) UNDER CONSTRUCTION. PROCEEDINGS OF SYMPOSIUM, MAY 7-9, 1979, OKLAHOMA CITY, OKLAHOMA

The first state-sponsored national EMS (emergency medical services) meeting is reported; it was also the first such meeting devoted solely to rural EMS, designed to provide for an exchange of information on rural EMS systems under development, to spotlight individuals with specific knowledge on construction of rural EMS system elements, and to review state legislature approaches to rural EMS system development. Alternatives to Federal guidelines were sought to meet rural needs more effectively, as well as ways to accelerate mechanisms for coordination of authorized Federal program funds; ideas for continued EMS funding at state and local levels were explored, and possible research areas necessary for continued rural EMS development were examined. The following 12 workshops provided an opportunity for panel members (representatives from nine sponsoring states) to converse with each other and the audience in two-hour sessions: rural physician's role, accessing the rural system, rural EMS training, rural regional system, rural communications, rural emergency nurse's role, special transportation problems in rural EMS, rural EMS model planning, funding and regulating the rural system, rural evaluation and data, university and hospital roles in rural EMS, and Agriculture Dept.'s role. The proceedings comprise three parts (opening statements, workshops, closing summaries). Appended are symposium comments, testimony before the Select Com. on Aging of the U.S. House of Representatives (Oklahoma City, 7 May 1979), and a list of attendees (representing 30 states). An outcome of this symposium was the establishment of the Mid-America States Rural EMS Council composed of representatives from the nine sponsoring states.

Oklahoma Highway Safety Office HS-805 182, 1980, 229p
Symposium co-sponsored by National Highway Traffic Safety Administration, and nine Mid-America states (Arkansas, Iowa, Kansas, Louisiana, Missouri, Nebraska, New Mexico, Oklahoma, and Texas).
Contract

NHTSA-P.O.-9-6209

Acknowledgment: National Highway Traffic Safety Administration
Order From: National Highway Traffic Safety Administration, 400 7th Street, SW, Washington, D.C., 20590

361557

WORKBOOK TO COMPARE MOTOR VEHICLE LAWS WITH THE UNIFORM VEHICLE CODE

A loose-leaf workbook is provided to help states bring their traffic laws into better conformance with the traffic laws and regulations of other states and the Uniform Vehicle Code (UVC). It is designed to facilitate a section-by-section comparison of the state traffic laws with the provisions and sections of selected UVC chapters. The initial chapters include Words and Phrases Defined and Rules of the Road. Other chapters may be subsequently added to the workbook. Recently revised or added sections of the chapters are indicated by year. The provisions of the chapters are reproduced in the first column (left-hand pages), the section numbers/titles indicated in bold-face type. The second column is for notes and references on administrative rulings and other pertinent items. The third column (right-hand pages) is for insertion of parallel provisions of the state's laws, and the fourth column is for comments.

National Highway Traffic Safety Administration HS-805 356, 1980, 108p
Reference copy only available National Highway Traffic Safety Administration.

Acknowledgment: National Highway Traffic Safety Administration
Order From: National Highway Traffic Safety Administration, 400 7th Street, SW, Washington, D.C., 20590

361558

A NEW GUIDE TO REFERENCE SERVICES IN THE NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

Collections housed in the National Hwy. Traffic Safety Administration's (NHTSA) reference library, the Technical Reference Div. (TRD), are described; and their relation to the program elements originating them is outlined. Reference materials include: research reports, multidisciplinary accident investigation case reports, defects investigation files, safety defect recall campaign files, consumer letters, compliance test files, certification information request files, consumer advisories, the Docket (i.e. information and data relating to rulemaking activities for motor vehicle and highway safety standards), standards information, research and testing films, and other materials (e.g. automotive manufacturer specifications, periodicals, and government documents). Some of these materials are abstracted in the monthly journal, Highway Safety Literature. The collections are housed in the TRD's Reading Room or in facilities within commuting distance. Tables are provided which present information on the TRD collections under the following headings: series title, series prefix and numbering system, date of first in series, approximate number of items, format, indexing, and use of collection.

Desmond, WF
National Highway Traffic Safety Administration HS-805 372, 1980, 23p, Refs.
See also HS-801 853.

Acknowledgment: National Highway Traffic Safety Administration
Order From: National Highway Traffic Safety Administration, 400 7th Street, SW, Washington, D.C., 20590

361559

COMPARATIVE DATA, STATE AND PROVINCIAL LICENSING SYSTEMS

An updated report improves the original reference document, "Comparative Data and Analysis in State Motor Vehicle Administration." Discussions and statistics are presented on requirements and restrictions of the various states relating to learners' permits, original and renewed driver's licenses, driver testing, selection of driver examiners, driver improvement programs, medical advisory boards, and driver licensing administration.

National Highway Traffic Safety Administration, American Association of Motor Vehicle Admin HS-805 335, 1980, 129p
Guidelines for Motor Vehicle Administrators series.

Acknowledgment: National Highway Traffic Safety Administration
Order From: GPO

361560

ASSESSMENT OF ENVIRONMENTAL IMPACTS OF LIGHT-DUTY VEHICLE DIESELIZATION

A first-level assessment is provided of the environmental effects which might result if diesel vehicles were produced and sold in large numbers, thereby changing the mix of vehicles in the in-use fleet. The impacts of diesel exhaust emissions on air quality are emphasized, especially particulate and odor effects. Projections are made to the year 2000, based on several selected scenarios for diesel growth. Areawide and local site air quality analyses are conducted. The areawide analysis examines pollutant dump effects in three metropolitan city areas (Manhattan, St. Louis, and Phoenix); the local site analysis investigates pollutant concentrations in several critical urban sites (the heavily traveled freeway, the street canyon, and the enclosed parking garage). The methodology is described, and results are presented in terms of trends in the emission inventories for the city-wide analysis and of pollutant concentration profiles for the local site analysis. The areawide analysis indicates that dieselization would increase urban total suspended particulates by less than 3%, while the air quality relative to hydrocarbons, carbon monoxide, and nitrogen oxides would improve. The local site analysis shows that dieselization would produce particulate concentrations ranging from 9 to 13 microgm./cu. m. at long-term exposure locations in the freeway and street canyon sites and 24 microgm./cu. m. in the enclosed parking garage. Odor effects in a nominal diesel-gasoline vehicle mix are found to be negligible.

Forrest, L Lee, WB Smalley, WM
Aerospace Corporation Final Rpt. DOT-TSC-NHTSA-80-5, HS-805 373, 1980, 347p, Refs.
Contract

DOT-TSC-1530

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: NTIS

361561

RSV (RESEARCH SAFETY VEHICLE) PHASE 3. PROGRESS REPORT, OCTOBER/NOVEMBER 1978

Progress and problems during the reporting period are detailed in the general areas of program management (Task 4) and design and development engineering (Task 5). Of particular interest are the following activities: testing of restraint systems; structural and systems refinement, including structural drawings; development of a new emergency egress concept for the door glass; updating of data used for simulation studies; work on a high technology engine and transmission, and on an advanced LRSV (large res. safety vehicle) engine; and other work on the LRSV, including structure, restraints, design, and technology transfer support. Appended are test data on the driver's and passenger's restraint system (50 mph frontal barrier impact), and a progress report (No. 20) on electronics for the RSV by RCA Labs.

Minicars, Incorporated HS-803 877U, 1979, 77p
Contract

DOT-HS-7-01552

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: Minicars, Incorporated, 55 Depot Road, Goleta, California, 93117

361562

RSV (RESEARCH SAFETY VEHICLE) PHASE 3. PROGRESS REPORT FOR FEBRUARY-MARCH 1979

The status of tasks in a research safety vehicle (RSV) project is evaluated. Design and development engineering progress focuses on product improvement of inflatable restraints (driver restraint and front passenger restraint systems), structural refinement (including front bumper no-damage performance), systems refinement, plastics, electronics system, ride and handling, pedestrian impact, compatibility analysis, high-technology engine/transmission, structures fabrication, systems fabrication, accident/benefit analysis, technology transfer support, glazing, production planning, and tooling. Progress on the LRSV (Large RSV) is concerned with an advanced engine, LRSV structure, restraints, design and dynamic tests, and the LRSV demonstration vehicle. Narrative, figures, and tables which supplement vehicle testing results are appended.

Grandfield, SD
Minicars, Incorporated BPR-2100-03-79, HS-804 827U, 1979, 181p, Refs.
Reference copy only available Minicars, Incorporated.
Contract

DOT-HS-7-01552

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: Minicars, Incorporated, 55 Depot Road, Goleta, California, 93117

361563

RSV (RESEARCH SAFETY VEHICLE) PHASE 3. PROGRESS REPORT FOR APRIL-MAY 1979

The status of tasks in a research safety vehicle (RSV) project is evaluated. Data and figures accompany narrative to reflect design and development engineering progress in such areas as product improvement of inflatable restraints, structural refinement, system refinement, plastic materials improvement, electronics system, braking and handling, pedestrian impact, compatibility analysis, injury and crash testing, high-technology engine/-transmission, structures fabrication, systems fabrication, emissions and fuel economy, accident/benefit analysis, production planning, and tooling. Progress on the LRSV (Large RSV) is concerned with the advanced engine, the LRSV structure, restraints, design, and dynamic tests, and technology transfer support. Supplementary test data and information on the electronics system are appended.

Grandfield, SD
Minicars, Incorporated BPR-2100-05-79, HS-804 831U, 1979, 50p
Reference copy only available Minicars, Incorporated.
Contract

DOT-HS-7-01552

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: Minicars, Incorporated, 55 Depot Road, Goleta, California, 93117

361564

RESEARCH SAFETY VEHICLE, PHASE 3. STATUS REPORT NO. 14, PERIOD: 1 MARCH TO 30 JUNE 1979

Most of Phase 3 activities of the RSV (research safety vehicle) program were completed during this reporting period. Phase 4 car numbers 6, 8, 9, and 10 were completed and delivered. The final report on driver air bag system development was completed, as well as reports on Phase 4 car 3 handling tests and barrier test 13. Other activities included development to improve the driver air bag and the passenger air belt restraint systems for Phase 4 tests, and support of those tests. Prior to shipment of car 8, performance tests demonstrated satisfactory acceleration, emissions, and fuel economy; bumper tests were also accomplished. A 41 mph flat frontal barrier test was performed using car 9; the passenger head exceeded the allowable Head Injury Criterion number defined by Federal Motor Vehicle Safety Standard 208 and the driver's left femur load was 100 1b. too high. European testing of the Phase 4 cars was initiated. Cars 6 and 10 were exhibited at the 7th International Conference on Experimental Safety Vehicles where a paper was presented on the Calspan/Chrysler RSV. French, Italian, and German representatives reported on their tests of the Phase 4 RSV's, indicating satisfactory compliance with specifications.

Calspan Advanced Technology Center CAL-ZN-6069-V-30, HS-804 908U, 1979, 105p
Contract

DOT-HS-7-01551

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: Calspan Advanced Technology Center, P.O. Box 400, Buffalo, New York, 14225

361565

RSV (RESEARCH SAFETY VEHICLE) PHASE 3. PROGRESS REPORT, JUNE/JULY 1979

Program management and design and development engineering (to the subtask level) progress made on the RSV (research safety vehicle) Phase 3 program is described for the 15th bimonthly reporting period. Subcontractor progress reports are appended. These include RCA Labs (electronics), Battelle-Columbus Labs. (pedestrian injury mitigation capabilities (knee-leg impact tests)), and Dubner Computer Systems (on-board computer). Also appended are data traces from an RSV side impact test conducted by Minicars.

Minicars, Incorporated BPR-2100-07-79, HS-805 115U, 1979, 99p
Contract

DOT-HS-7-01552

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: Minicars, Incorporated, 55 Depot Road, Goleta, California, 93117

361566

THE NHTSA'S (NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION'S) VIEW OF MOTORCYCLE CRASH INJURY REDUCTION

The anticipated growth in motorcycle and moped usage because of gasoline cost and availability, and the accompanying increase in motorcycle accidents and casualties, are addressed. There is a lack of motorcycle accident data; the National Hwy. Traffic Safety Administration (NHTSA) is sponsoring the first multidisciplinary investigation of motorcycle crashes in the U.S. (a two-year study of 900 accidents to be conducted by the Univ. of Southern California). The motoring public must be informed about the inherent hazards of motorcycle use. The best long-term approach to motorcycle safety is through crash avoidance programs. Countermeasures include operator licensing and testing programs, education and training, and improved motorcycle/rider conspicuity. Continued emphasis on motorcycle safety helmets and other protective apparel to minimize injuries is supported. Other NHTSA motorcycle safety activities are reviewed: nine Federal Motor Vehicle Safety Standards, compliance testing, and safety defect investigations; and safety research projects (e.g. state-of-the-art study; development of training and testing materials, operator hearing and vision requirements, and improved brakes and tires; and analysis of crash dynamics).

Buchanan, LS
National Highway Traffic Safety Administration HS-804 770U, 1975, 17p, 6 Ref.

Presented at 19th Annual Meeting of American Association for Automotive Medicine, San Diego, 21 Nov. 1975.

Acknowledgment: National Highway Traffic Safety Administration
Order From: National Highway Traffic Safety Administration, 400 7th Street, SW, Washington, D.C., 20590

361567

INTRODUCTION AND OVERVIEW OF THE ROLE OF THE U.S. DEPARTMENT OF TRANSPORTATION IN EMS (EMERGENCY MEDICAL SERVICES) SYSTEMS

A 1966 status report by the National Acad. of Sciences underlined the inadequacies of the nation's emergency medical services (EMS) system. Progress made in the EMS system since the Highway Safety Act of 1966 is reviewed, specifically that resulting from National Hwy. Traffic Safety Administration (NHTSA) activities. NHTSA developed a Hwy. Safety Prog. Manual containing guidelines for state and local governments on EMS planning, evaluation, and improvement. It promulgated an EMS standard for highway safety programs, issued a state requirement for developing a Comprehensive EMS Plan, and supported eight demonstration projects addressing every element of the EMS system. Today, all 50 states, Puerto Rico, and the District of Columbia have full-time EMS staffs. NHTSA efforts have resulted in a guide for ambulance service economics, ambulance design criteria, the "Star of Life" EMS symbol, adoption of a minimal standard for ambulance equipment, the job designation of emergency medical technician (EMT) and a standard for certification, and training courses for EMT's and law enforcement officers. NHTSA supported the first national conference on the 911 national emergency telephone number, and has conducted studies on citizen access and accident reporting through Citizens Band radio. The agency developed guidelines and a planning document for EMS communications and provided an impetus for EMS discrete frequency allocation. Two Medical Emergency Coordination Communication Assessment centers were established by NHTSA to provide rapid-response EMS via advanced electronics, and the agency is involved in the cooperative Military Assistance to Safety and Traffic program. Significant NHTSA policy statements have addressed rural community EMS and state EMS legislation. The agency strives to ensure, through its administrative and funding efforts, that the best known resources are applied in emergency medical care.

National Highway Traffic Safety Administration HS-805 022U, 1971, 13p, Refs.

Reference copy only available National Highway Traffic Safety Administration.

Acknowledgment: National Highway Traffic Safety Administration
Order From: National Highway Traffic Safety Administration, 400 7th Street, SW, Washington, D.C., 20590

361568

NATIONAL HIGHWAY SAFETY FORECAST AND ASSESSMENT. A 1985 TRAFFIC SAFETY SETTING

The first annual National Hwy. Safety Forecast and Assessment presents a broad picture and specific environmental and traffic parameters expected in 1985 (using 1972 as the base year). The purpose is to set the framework within which national five-year highway safety plans can be developed. Trends are projected for the following exposure factors: alcohol, vehicle mix, speed, gross exposure factors (population, drivers, registrations, vehicle miles), young drivers, older drivers, pedestrians, bicyclists, and motorcyclists. Unless greater progress is made in developing and implementing effective countermeasures, the traffic safety outlook for 1985 is for much heavier losses on the nation's roadways, the fifty-five mile per hour speed limit notwithstanding.

National Highway Traffic Safety Administration HS-805 024U, 1975, 63p, Refs.

Reference copy only available National Highway Traffic Safety Administration.

Acknowledgment: National Highway Traffic Safety Administration
Order From: National Highway Traffic Safety Administration, 400 7th Street, SW, Washington, D.C., 20590

361569

DOCUMENTATION ON KEY STATE TRAFFIC SAFETY PROGRAMS

A list of items for specific attention in annual highway safety work programs is presented: motorcycle safety legislation, blood alcohol concentration (BAC), classified driver's license, motor vehicle inspection, uniform rules of the road, driver's license advisory boards, reporting of traffic court convictions, emergency medical services, periodic driver examination, school bus safety, selective traffic law enforcement, driver improvement programs, and BAC testing. For each item, rationale, NHTSA (National Hwy. Traffic Safety Administration) position, model law, and documentation (except for driver improvement programs) are provided.

National Highway Traffic Safety Administration HS-805 091U, 1973, 518p, Refs.

Reference copy only available National Highway Traffic Safety Administration. Includes variously numbered papers previously announced. See also HS-805 092U.

Acknowledgment: National Highway Traffic Safety Administration
Order From: National Highway Traffic Safety Administration, 400 7th Street, SW, Washington, D.C., 20590

361570

A COMPENDIUM OF STATE TRAFFIC SAFETY PROGRAM ASSESSMENTS

The material is arranged under the following categories: motorcycle safety legislation, blood alcohol concentration (BAC), classified driver's license, motor vehicle inspection, uniform rules of the road, driver's license advisory boards, reporting of traffic court convictions, emergency medical services, periodic driver examination, school bus safety, selective traffic law enforcement, driver improvement programs, and BAC testing.

National Highway Traffic Safety Administration HS-805 092U, 1973, 84p, Refs.

Reference copy only available National Highway Traffic Safety Administration. Includes HS-027 323U and variously numbered other papers previously announced. See also HS-805 091U.

Acknowledgment: National Highway Traffic Safety Administration
Order From: National Highway Traffic Safety Administration, 400 7th Street, SW, Washington, D.C., 20590

361571

EMERGENCY MEDICAL SERVICES FOR AN URBAN AREA: THE DETROIT DEMONSTRATION PROGRAM. SUMMARY

A study was conducted to demonstrate and evaluate existing and alternative methods of providing emergency medical services in an urban area (namely, Detroit). Speed of service, quality of treatment, and cost were considered. The types of services included the police and fire rescue squad emergency response systems presently in use, a commercial ambulance service, and a helicopter ambulance supplementing ground systems. It was found that as few as 17% of the emergency responses made by public ambulances were for true medical emergencies. For the ground ambulance systems studied, the mean time from dispatch to arrival at scene was less than five min. The time from dispatch to hospital arrival for police, commercial, and fire systems averaged 17.5, 14.3, and 13.1 min., respectively. Ambulance personnel responsible only for emergency medical care at the scene (fire and commercial systems) provided appropriate treatment more often than police who have to perform multiple functions at the scene. Little difference was found in response times between a uniform and a high-demand ambulance distribution policy. The helicopter ambulance was effective in executing medical evacuations. It was concluded that it would be difficult to further reduce response times significantly, that dual-function personnel, comparably trained and equipped, can provide quality medical treatment if that is their sole responsibility, and that the increased cost of an exclusive helicopter service is not justified. The major recommendation was that immediate action be taken to transfer the entire public emergency ambulance service to the Detroit Fire Dept.

Krause, JL Scott, RE
Detroit Mayor's Commission for Community Renewal, Highway Safety Research Institute HS-805 020U, 1970, 56p, Refs.

Reference copy only available Detroit Mayor's Commission for Community Renewal.
Contract

DOT-FH-11-6901

Acknowledgment: National Highway Traffic Safety Administration
Order From: Detroit Mayor's Commission for Community Renewal, Detroit, Michigan

361572

BASIC TRAINING PROGRAM FOR EMERGENCY MEDICAL TECHNICIAN--AMBULANCE. COURSE GUIDE AND COURSE COORDINATOR ORIENTATION PROGRAM

The course guide was prepared to aid in organizing, conducting, and standardizing a basic training course for emergency medical technicians (EMT's). It contains a detailed outline of the course; prerequisites for both students and instructors; suggested scheduling and class size; facility, training aid, and reference material requirements; and guidelines for conducting the course. The course covers all techniques of emergency medical care and operational aspects of the EMT's job. The course emphasizes the development of student skill in recognition of symptoms of illnesses and injuries and proper procedures of emergency treatment. Heavy reliance is placed on demonstration and practice as a teaching method. The course consists of 25 lessons involving 71 hr. of classroom plus 10 hr. of in-hospital observation and training. A class size limit of 20 is suggested for lecture-demonstration periods and 10 for practice periods. Lead instructors and their aides must be experienced in the field of emergency care or specialists in a given topic area, be skilled in using all equipment, be knowledgeable about legal constraints under which EMT's operate, and be skilled instructors. The student must have a high school diploma or equivalent, be proficient in English, hold a driver's or chauffeur's license, be at least 18, and be physically fit and motivated. He will be evaluated in terms of five criteria: skill, knowledge, personal attitude, personal appearance, and attendance.

Fucigna, JT   Pepler, RD   Cleven, A
Dunlap and Associates, Incorporated   HS-805 021U, 1971, 46p, 17 Ref.
Contract

DOT-FH-11-6967

Acknowledgment: National Highway Traffic Safety Administration
Order From: GPO

361588

ANALYSIS & SUMMARY OF ACCIDENT INVESTIGATIONS 1977-1979

The Federal Highway Administration's Bureau of Motor Carrier Safety through its various programs of notification, reporting, and investigation, is continually evaluating the accident experience of commercial motor carriers to determine specific problem areas. Such areas involve accidents of a recurring nature, and violations of the Federal Motor Carrier Safety Regulations and Hazardous Materials Regulations. This method of evaluation reveals the need to strengthen the effectiveness of such regulations through enforcement action against motor carriers that are not in compliance to promote safety over the Nations's highways. Detailed investigations of accidents of unusual severity are conducted by the Bureau's field staff whenever a motor carrier's vehicle, cargo, or personnel contributed notably to actual or probable cause; and in cases of particular interest to the general public and the Bureau. This report, comprised of accident investigations for the years 1977 through 1979, a three year study, is a second edition which will provide analytical data covering types of accidents in direct relationship to human, vehicle, and environmental factors. A total of 346 accidents, which resulted in 518 fatalities, 1,211 injuries, and $22,190,693 property damage, were investigated by the Bureau's field staff during this period. The statistical data is shown in tabular form for easy reference. A summation of the accident investigations, in narrative form, is presented separately for each year. Although a significant number of the Nation's more serious motor carrier accidents are covered in this report, statistical comparisons on an industry-wide basis, such as comparing this data with total vehicles, mileage, drivers or experience of prior years, is not recommended. This study is biased in that the accidents included are of a serious nature and deemed chargeable to the motor carrier's vehicle and/or driver in the majority of cases. This analysis is one of the few detailed accident studies in which probable cause and contributing factors are indicated.

Federal Highway Administration   HS-032 615, Mar. 1981, 107p, Phots.

Acknowledgment: National Highway Traffic Safety Administration
Order From: Federal Highway Administration, Bureau of Motor Carrier Safety, Washington, D.C., 20590

361589

MOTOR CARRIER ACCIDENT INVESTIGATION

On December 24, 1980, at 11:13 a.m. P.S.T. on Interstate 5, milepost 5, Kern County 950, 10 miles north of Lebec, California, a truck-tractor semitrailer, operated by Agate Elevator Agricultural Livestock Cooperative Association and traveling northbound at a speed estimated to be 120 m.p.h. on a 6 percent downgrade, overturned and struck the left rear of a station wagon, then slid on its side into the rear of a Roadway Express (Akron, Ohio) truck. There was no fire but the accident resulted in two fatalities, four injuries and $250,000 of property damage. The probable cause of this accident was excessive speed, deficient brakes, tractor brakes out of adjustment, trailer brakes inoperative, and ruptured diaphragm.

Federal Highway Administration   80-8, HS-032 621, 1981, 9p, 2 Phot.

Acknowledgment: National Highway Traffic Safety Administration
Order From: Federal Highway Administration, Bureau of Motor Carrier Safety, Washington, D.C., 20590

361590

CAR WORDS. A BASIC GLOSSARY OF AUTOMOTIVE TERMINOLOGY PART I

While space limitations prevent us from detailing every word that pertains to your car, the following automotive lexicon has been compiled to provide you with a fairly broad cross-section of the terms most often encountered. In an effort to help you develop an even better understanding of your car and how it functions, we've also included a number of thumbnail overviews of major automotive systems and subsystems.

Nagy, B   *Motor Trend* Vol. 33 No. 10, HS-032 617, Oct. 1981, pp 79-83

Acknowledgment: National Highway Traffic Safety Administration
Order From: Petersen Publishing Company, 8490 Sunset Boulevard, Los Angeles, California, 90069

361591

SPECIAL STUDY--FATALITIES AND INJURIES ASSOCIATED WITH RIDING IN CARGO AREAS OF PICKUP TRUCKS

An average of 242 persons were killed each year from 1975 through 1979 in accidents while riding in the cargo areas of pickup trucks, according to data from the National Highway Traffic Safety Administration's (NHTSA) Fatal Accident Reporting System (FARS). In 1979, the Safety Board investigated an accident involving a compact pickup truck in which the driver and three persons were riding in the cab and eight persons were in the open-cargo area of the truck. The driver failed to negotiate a curve and the truck ran off the road and overturned. Seven persons in the cargo area were killed. As a result of its investigation of this accident, the Safety Board recommended that the National Committee on Uniform Traffic Laws and Ordinances (NCUTLO) establish model guidelines for prohibiting passengers from riding in open cargo areas of most vehicles. The NCUTLO had considered model guidelines on a broader scale in 1975, but because of several complications, the proposal was rejected. This study was made to demonstrate further the need for model guidelines prohibiting passengers from riding in the cargo area of a vehicle, and to make available information about the dangers to passengers riding in the open cargo area of a vehicle. Recommendations are made to the NCUTLO, the National Highway Traffic Safety Administration, the Insurance Institute for Highway Safety, the Motor Vehicle Manufacturers Association, the National Safety Council, Automobile Importers of America and to the Governors of the 50 States.

National Transportation Safety Board   NTSB-HSS-81-2, HS-032 616, Sept. 1981, 21p, 4 Fig., 7 Tab.

Acknowledgment: National Highway Traffic Safety Administration
Order From: NTIS

PB82-115593

361592

HIGHWAY ACCIDENT REPORT--CONTINENTAL TRAILWAYS, INC., SCHEDULED INTERCITY BUS/MULTIPLE-VEHICLE COLLISION AND FIRE, INTERSTATE ROUTE 95, NEAR BELTSVILLE, MARYLAND, APRIL 20, 1981

About 5:55 p.m. on April 20, 1981, a scheduled intercity bus with 34 passengers onboard was southbound on Interstate Route 95 (I-95) en route to Washington, D.C., via Silver Spring, Maryland. As the bus approached the Interstate Route 495 (Capital Beltway) interchange, the traffic ahead in the right lane slowed and came to a stop. The bus failed to stop, crashed into the rear of the automobile ahead of it, and precipitated a four-car, front-to-rear-end collision. Two of the automobiles burst into flames which quickly spread to and engulfed the bus after it had been evacuated. Three occupants of the automobile struck by the bus were killed. The drivers of the other three automobiles, the busdriver, and the 34 bus passengers received minor injuries. The National Transportation Safety Board determines that the probable cause of this accident was the failure of the busdriver to maintain a safe stopping distance between the bus and the automobile ahead as traffic ahead slowed and came to a stop during the peak traffic period. Contributing to the cause and severity of the fires was the separation of the filler pipes from the fuel tanks of two of the automobiles.

National Transportation Safety Board NTSB-HAR-81-5, HS-032 614, Sept. 1981, 24p, 12 Fig., 1 App.

Acknowledgment: National Highway Traffic Safety Administration
Order From: NTIS

PB82-117524

361593

REMOVING HELMETS FROM ACCIDENT VICTIMS

This article, primarily written for ambulance drivers, emergency room personnel and other trained people, explains, step by step, how to safely remove motorcycle helmets from unconscious accident victims, thereby preventing damaging the cervical cord when the overlying bony structure has been fractured. Each step of this method is accompanied by photos, and the method itself has been publicized by the Committee on Trauma of the American College of Surgeons.

Driver Vol. 14 No. 11, HS-032 601, Apr. 1981, pp 14-15, 7 Phot.

Acknowledgment: National Highway Traffic Safety Administration
Order From: GPO

361594

ONE OF ENGINEERING'S NINE CHALLENGES: SAFETY

The Society of Automotive Engineers (SAE) says improving safety in self-propelled vehicles is one of the nine challenges facing engineers as we approach the 21st century. The other challenges are energy, environment, materials, productivity, design, ingenuity, credibility, interaction and education. This article describes some of the things that were seen and heard at SAE's International Congress, where all the challenges were on the agenda.

Driver Vol. 14 No. 12, HS-032 627, May 1981, pp 14-19, Phots. Society of Automotive Engineers, International Congress and Exposition, Detroit, Michigan, 1981.

Acknowledgment: National Highway Traffic Safety Administration
Order From: GPO

361595

SAFE GROUP RIDING

The pleasures and the dangers of group motorcycle riding are outlined. The numerous rules which have to be established for the group before any bike rolls down the road are explained. The establishment of signals, both CB and hand signals is emphasized, and hand signals are illustrated with photos.

Driver Vol. 15 No. 1, HS-032 608, June 1981, p 1, Phots.

Acknowledgment: National Highway Traffic Safety Administration
Order From: GPO

361596

SECRETS OF TOWING WITH YOUR COMPACT CAR

Ten small cars from Detroit manufacturers were tested pulling various trailered boats. Every rig worked well because special attention to details was paid: safety factors, load matching and performance features were considered carefully. Six rules are given to insure trouble-free towing. The article is illustrated.

McKeown, B *Popular Mechanics* Vol. 156 No. 5, HS-032 632, Nov. 1981, pp 102-105, Phots.

Acknowledgment: National Highway Traffic Safety Administration
Order From: Hearst Magazines, 224 West 57th Street, New York, New York, 10019

361597

SPLIT-PERSONALITY TRANSMISSION SHIFTS LIKE AN AUTOMATIC, SAVES FUEL LIKE A MANUAL

A new automatic transmission has been developed by Britain's Automotive Products Ltd, and is based on an ordinary synchromesh manual gearbox. It has the same high mechanical efficiency and fuel economy as the manual version since there's no torque converter, and both hydraulic slip and creeping at red lights have been eliminated. Furthermore, it's small enough to fit alongside the transverse engines in the smallest front-drive cars. The transmission's biggest appeal to manufacturers is its use of standard parts, already made for existing manual transmissions. In addition A.P. already makes some of the clutches and hydraulic actuators, so major tooling could be avoided and production, at low cost, could start within a couple of years.

Scott, D *Popular Science* Vol. 219 No. 5, HS-032 613, Nov. 1981, p 92

Acknowledgment: National Highway Traffic Safety Administration
Order From: Times Mirror Magazines, Incorporated, 380 Madison Avenue, New York, New York, 10017

361598

SAVE THAT CHILD: CHILDREN AND AUTOMOBILE RESTRAINTS

This editorial challenges readers to work toward the goal of increased safety on the highway through the use of automobile restraint systems. Pointing out many of the facts which prove the effectiveness of safety belts, it is stated that, "As a public health principle, it seems important to determine the risk before withholding the protective "vaccine". In this instance, all children, as well as the remainder of the adult population, have been well demonstrated to be at far greater risk when unprotected with automobile restraints."

American Journal of Public Health Vol. 71 No. 2, HS-032 629, Feb. 1981, pp 122-123, 7 Ref.

Acknowledgment: National Highway Traffic Safety Administration
Order From: American Public Health Association, 1740 Broadway, New York, New York, 10019

361599

RASHID RADAR BRAKE ISSUE HEATS UP

Preliminary reports on the Rashid radar brake are favorable, but the brake system has not yet been tested by NHTSA. Prototype systems have been promised but not delivered to NHTSA by Vehicle Radar Safety Systems Inc. of Mt. Clemens, MI. It seems that due to the competitive nature of the auto industry, there is concern about someone stealing the design. NHTSA has assured the owners that safety testing and the reporting of test results to the public are their only concern, and that NHTSA is not planning any further technology development on radar brakes.

Callahan, JM *Automotive Industries* Vol. 161 No. 11, HS-032 612, Nov. 1981, pp 67-69

Acknowledgment: National Highway Traffic Safety Administration
Order From: Chilton Company, Chilton Way, Radnor, Pennsylvania, 19089

361600

ROLE OF COMPUTER GRAPHICS IN REALTIME TRAFFIC CONTROL SYSTEMS

This article demonstrates how computer graphics can be used to help the traffic engineer retime traffic signals within a computerized signal system. The system described is called KARTS--the Kettering Area Responsive Traffic System. Using 1976 dollars, the entire system cost just over one million dollars.

Oaks, RL *Public Roads* Vol. 45 No. 2, HS-032 607, Sept. 1981, pp 62-67, 10 Fig.

Acknowledgment: National Highway Traffic Safety Administration
Order From: Federal Highway Administration, 400 7th Street, SW, Washington, D.C., 20590

361601

RESULTS OF A LONGITUDINAL EVALUATION OF COURT-MANDATED DWI TREATMENT PROGRAMS IN PHOENIX, ARIZONA

This article evaluates rehabilitation activities of the Alcohol Safety Action Program in Phoenix, Arizona. The short-term rehabilitation study called for random assignment of persons arrested for driving while intoxicated (DWI) to short-term treatment and control (minimum-exposure) conditions. A test battery, the Life Activities Inventory, was developed to permit assessment of treatment outcome in terms of a number of dimensions of client behavior. The results of this analysis raise doubts about the effects of short-term treatment on the behavior of DWI offenders referred by the courts, for men in three types of short-term treatment programs showed few differences in drinking patterns, drinking-related behavior and social adjustment at 6 months, 12 months and 18 months after treatment.

Swenson, PR (City of Phoenix Municipal Court) Struckman-Johnson, DL Ellingstad, VS (South Dakota University, Vermillion) Clay, TR (California University, Irvine) Nichols, JL (National Highway Traffic Safety Administration) *Journal of Studies on Alcohol* Vol. 42 No. 7, HS-032 603, July 1981, pp 642-653, 4 Fig., 14 Ref.

Acknowledgment: National Highway Traffic Safety Administration
Order From: Rutgers University, New Brunswick, Rutgers Center of Alcohol Studies, Publication Division, New Brunswick, New Jersey, 08903

361602

DEATH AND INJURY ROAD ACCIDENTS IN NORTHERN IRELAND 1980

This very extensive report contains a review of the year, a summary, a definition of terms used in the tables, 11 graphs and 24 tables. It also includes a comparison of road deaths per 10,000 vehicles for most of the European countries, Australia, Canada, Japan, New Zealand and the United States of America. There has been a decrease in road accidents and persons killed and injured. Pedestrians involved in accidents have the highest number of fatalities, especially elderly pedestrians. Accidents involving children show a reduction as compared to the previous year, and there was a fall in the number of motorcyclist fatalities. The drink factor in driver causation in accidents has fallen considerably when compared with the past number of years. Still, excessive speed and drink are the main causes in fatal road accidents; whilst in accidents generally, the principal factors are: (1) Excessive Speed; (2) Entering Major Road; and (3) Inattentive or attention diverted.

Royal Ulster Constabulary HS-032 606, 1980, 53p, 24 Tab.

Acknowledgment: National Highway Traffic Safety Administration
Order From: Royal Ulster Constabulary, Traffic Division Headquarters, Montgomery Road, Belfast, Northern Ireland

361603

RESULTS OF THE STUDY ON TWO-WHEELED MOTOR VEHICLES...

A questionnaire on two-wheeled vehicles was sent out to a number of member-countries of the International Road Safety (P.R.I.) with the aim of comparing the situation in a number of selected countries, with special emphasis on the situation in France as compared to other countries. Forty countries were included but only 15 of them replied. Notable for their absence were the United States, West Germany and Italy but the study still gives a fairly good picture of the current situation regarding two-wheeled vehicles in most of the European countries, along with Japan. The questions used fall into two main categories: (1) regulations governing the use of two-wheeled vehicles, including vehicle classification schemes, mandatory parts and equipment, minimum age requirements for license, and use of helmets,and (2) education and training for riders, including driving tests, instructor training programs etc. A summary of the results is shown in tables, with a brief commentary on each of the tables.

Prevention Routiere Internationale No. 11-12, HS-032 625, 1980, 18p, 13 Tab.

Acknowledgment: National Highway Traffic Safety Administration
Order From: Prevention Routiere Internationale, 55 rue le Marois, 75016 Paris, France

361604

SMALL TRANSIT VEHICLES. TECHNOLOGY SHARING STATE-OF-THE-ART OVERVIEW AUGUST 1981

As part of its ongoing commitment to the principle of technology sharing, the U.S. Department of Transportation has initiated a series of publications based on research-and-development efforts sponsored by the Department. The series is comprised of technical reports, state-of-the-art documents, newsletters and bulletins, manuals and handbooks, bibliographies, and other special publications. All share a primary objective: to contribute to a better base of knowledge and understanding throughout the transportation community, and thereby, to improve the basis for decision-making within the community. This document presents both an update and expansion of a 1975 Technology Sharing document which profiled small transit vehicles. This document presents information on the vehicles available and on the selection, procurement, and operational considerations of using small transit vehicles in a transportation service. The information contained in this document is drawn from over 100 sources including conversations with transportation system operators, state and local planners, and vehicle suppliers. It is intended to be used as a guide to assist providers of transportation services, and community and state planners, in the selection and use of small transit vehicles. Included in this document is supplementary material serving as a sourcebook for further information.

Transportation Systems Center DOT-TSC-OST-81-6, HS-032 639, 1981, v.p., 27 Fig., Phots., 120 Ref., 7 App.

Acknowledgment: National Highway Traffic Safety Administration
Order From: GPO

361605

A SELECTED REVIEW OF WINTER DRIVING AIDS

This report describes briefly the evolution of winter driving aids that accompanied the evolution of the tire. Examples are given of patents issued for antiskid devices and tire additives. Discussion of mud and snow tires, studs, and chains follows. It is concluded that chains are the best winter driving aid available despite their drawbacks.

Williams, H *Tire Science and Technology* Vol. 7 No. 3-4, HS-032 633, July 1979, pp 58-70, Figs., 12 Ref.

Acknowledgment: National Highway Traffic Safety Administration
Order From: American Society for Testing and Materials, 1916 Race Street, Philadelphia, Pennsylvania, 19103

361606

SIMULATION OF VEHICLE COLLISIONS BY SCALE MODEL VEHICLES--ANALYSIS OF FRONTAL AND SIDE IMPACTS

Collision experiments using model vehicles are considered to simplify the processes and to minimize costs compared to experiments using full-scale vehicles. We fabricated model vehicles placing priority on the analysis of the vehicles' behavior during impact, and performed impact experiments with model vehicles for various impact types, then compared the crashworthiness with that of full-scale vehicles. As a result of these experiments, we have proved that the crashworthiness of model vehicles corresponds considerably to that of full-scale vehicles and the impacts of model vehicles can simulate those of full-scale vehicles. These results indicate that experiments using model vehicles is a very effective method to estimate the vehicle crashworthiness at impact.

Ohmae, H Kurihara, K Okami, Y (Japan Automobile Research Institute, Incorporated) Morisawa, M (Musashi Institute of Technology, Japan) Sato, TB *JSAE Review* No. 4, HS-032 637, Mar. 1981, pp 93-103, 12 Fig., 1 Tab., 11 Ref.

Acknowledgment: National Highway Traffic Safety Administration
Order From: Society of Automotive Engineers of Japan, Inc, 10-2 Goban-cho, Chiyoda-ku, Tokyo 102, Japan

361607

SCHOOL BUS USE FOR NON-SCHOOL TRANSPORTATION

This Information Bulletin discusses the fundamental issues involved in using school buses for non-school transportation in either a crisis or non-crisis situation. The degree to which the issues that will be discussed represent obstacles to school bus use varies from state to state and from county to county. It also varies depending upon the context in which the need emerges to implement such use. Broadly speaking, there are five pairs of contexts, the former in each pair being the easier scenario in which to implement a school bus use program: (1) Energy crisis or other emergency condition vs. Non-crisis situation; (2) Service is needed for elderly and handicapped or other special user group vs. Regular, fixed-route or feeder service is needed for commuters or general public; (3) School buses are owned and operated by a private company vs. School buses are owned and operated by the public sector; (4) The need for transportation arises in a rural area vs. The need arises in a suburban or an urban area; and (5) Service is needed for offpeak periods vs. Service is needed during the peak periods. The difference in the set of circumstances in each pair changes the perspective with which the need is viewed by those who would be responsible for initiating and implementing such programs. The problems and obstacles are generally accentuated in the latter scenario in each case.

Public Technology, Incorporated, Department of Transportation HS-032 630, Sept. 1980, 67p, Tabs., 1 App.

A Report of the Transportation Task Force of the Urban Consortium for Technology Initiatives.

Acknowledgment: National Highway Traffic Safety Administration
Order From: Public Technology, Incorporated, 1301 Pennsylvania Avenue, NW, Washington, D.C., 20004

361608

SAFETY EFFECTIVENESS EVALUATION--THE USEFULNESS OF INSURANCE DATA IN HIGHWAY SAFETY RESEARCH

The National Transportation Safety Board has evaluated the potential usefulness of insurance data in highway safety research. In the course of the study, the Safety Board reviewed methods used by the insurance industry to gather and process applications, claims, and other data that insurance companies use in their routine business. Additionally, the Safety Board reviewed past and current attempts by Federal agencies to use insurance data in highway safety research. The Safety Board concludes that most of the data collected by insurance companies are inappropriate for use in highway safety research. However, some data are potentially useful. In its evaluation, the Board cites examples of Federal safety research that has made beneficial use of insurance data. The Board also cites research efforts that attempted to use insurance data in inappropriate ways. The Board recommends that DOT and the insurance industry establish a formal consultative arrangement, through AIRAC, an insurance industry research committee, to avoid future inappropriate use of insurance data.

National Transportation Safety Board NTSB-SEE-81-5, HS-032 626, Aug. 1981, 53p, 2 Tab., 5 App.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: NTIS

PB82-107418

361609

THE ON-LINE USE OF PERFORMANCE MEASURES TO PREDICT DRIVING FATIGUE

The experiment reported herein examined the use of driving performance measures to predict whether a driver was suffering from sleep-loss and/or excessive driving time. The experiment was conducted on a closed 7.2 km oval track. Each subject driver drove around the track at about 80 kph for three hours on the first test day. For the next 21 hours, each driver remained awake and, at regular selected intervals, performed a battery of behavioural tests. On day two, 24 hours after beginning the first driving period, each subject began to drive for a second 3-hour period. The data from each driving period in the first 27-hour session were analyzed to determine which set of performance variables best discriminated between the performance from each 3-hour driving period. The resulting variables were then programmed into a micro-computer located on-board the test vehicle. Two weeks later, each subject returned to repeat the original 27-hour schedule. During this session, however, the performance of each subject was monitored on-line by the on-board computer. If their performance deteriorated below the criterion established from the data originally collected, the computer, through a D/A link, attempted to alert each driver. Results suggest that the multivariate criteria are able to discriminate between performance from the second 3-hour drive and that from the first at better than chance levels. The results are discussed in terms of an alertness indicator for highway vehicles.

Attwood, DA Scott, PL
Transport Canada Research and Development Centre Tech Memo HS-032 624, 1981, 12p, 4 Tab., Refs.

Prepared for the 25th Annual Meeting of the Human Factors Society, Rochester, New York, October 1981.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: Transport Canada Research and Development Centre, Road Safety Unit, Montreal, Quebec H3A 2R3, Canada

361610

THE 1981 HIGHWAY SAFETY STEWARDSHIP REPORT

This is the seventh annual report of the highway safety improvement programs. In accordance with Section 203 of the 1973 Highway Safety Act and 23 USC 151 and 152, reports are required for the Rail-Highway Crossing Program, the Pavement Marking Demonstration Program, and the Hazard Elimination Program. Although not required by statute, the report also includes information on safety projects funded with other Federal-aid and State and local funds to provide a more complete perspective of State and local highway safety efforts. Other topics covered in the report include highway related safety program standards, highway safety research and development, safety training, motor carrier safety, and highway safety information. Information included in this report was obtained from reports submitted by the States (i.e., the 50 States plus Puerto Rico, District of Columbia, Virgin Islands, Guam, and American Samoa), from Federal Highway Administration (FHWA) fiscal control records, and from information received from FHWA field offices and other sources. Data in this report is as of September 30, 1980, unless otherwise indicated. Fifty-three of the 55 States provided reports varying in the quality and quantity of information provided. Some States provided a minimum of information and evaluation data while other States did an outstanding job in providing a complete picture of the overall safety program in their respective States.

Federal Highway Administration HS-032 623, Apr. 1981, v.p., Figs., Tabs., 6 App.

Report of the Secretary of Transportation to the United States Congress Pursuant to Section 203, P.L. 93-87 and 23 U.S.C. 151 and 152.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: Federal Highway Administration, Office of Highway Safety, 400 7th Street, SW, Washington, D.C., 20590

361611

THE EFFECT OF A HUMP AND AN ELEVATED PEDESTRIAN CROSSING ON VEHICLE COMFORT AND CONTROL

The speed reducing construction jolts the vehicle driving at a too high speed in an unpleasant way. This report deals with two speed reducing constructions, a hump and an elevated pedestrian crossing. Attempts have been made to seek for these constructions and for each vehicle type a typical limit speed which causes an intolerable feeling of uncomfort or makes the control of the vehicle difficult during braking. The elevated pedestrian crossing does not hamper the control of any tested vehicle and the hump only the control of an empty delivery van when braking at speeds exceeding 40 kmph. The hump is intolerably uncomfortable for heavy vehicles already at speeds below 40 kmph and an elevated pedestrian crossing at speeds exceeding 40 kmph. The hump was at none of the speeds investigated intolerably uncomfortable for passenger cars. Without hampering the controllability of the vehicle the elevated pedestrian crossing can be used as a speed reducing construction, but the hump affects the control of some vehicle groups in certain extreme situations.

Laitakari, P Alppivuori, K
Technical Research Centre of Finland Report 69, HS-032 620, May 1981, 36p, 8 Fig., 5 Tab., Phots., 1 Ref., 6 App.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: Technical Research Centre of Finland, Technical Information Service, Vuorimiehentie 5, SF-02150 Espoo 15, Finland

361612

SAFER GASOLINE TANKERS FOR MICHIGAN. AN INTERVIEW WITH ROBERT D. ERVIN

In a research study conducted for the State of Michigan, an HSRI research team developed specifications for new tanker vehicles that will greatly reduce rollover accidents and fires resulting from them. Here the project director, Robert D. Ervin, discusses recommendations made to the State Legislature.

HSRI Research Review Vol. 11 No. 5, HS-032 609, Mar. 1981, 11p, Phots.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: Highway Safety Research Institute, Huron Parkway and Baxter Road, Ann Arbor, Michigan, 48109

361613

COMPUTER SIMULATIONS OF HEAVY-TRUCK DYNAMICS

Eight different computer simulation models have been developed at HSRI for studying the dynamic performance of heavy trucks. To obtain parametric inputs for the computer programs, HSRI also uses six special facilities developed to measure properties of vehicles, suspension systems, braking systems, and tires. The computer models and measurement facilities were developed over several years with research support mainly from the Motor Vehicle Manufacturers Association, and have been used in recent or current research programs sponsored by the National Highway Traffic Safety Administration, the Federal Highway Administration, the Motor Vehicle Manufacturers Association, and other industrial or governmental organizations. As an overview for nonspecialists, this article briefly describes those research resources and their applications.

Fancher, PS *HSRI Research Review* Vol. 12 No. 2, HS-032 611, Sept. 1981, 16p, Phots.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: Highway Safety Research Institute, Huron Parkway and Baxter Road, Ann Arbor, Michigan, 48109

361614

SEMINAR ON DRIVING 1979

An accident exposure study was initiated by the Road Traffic Safety Research Council of New Zealand in 1976 to establish the real accident rate for each age and sex group, after taking into account the amount of driving done by each group, the time it is done, and the types of vehicles used. On May 14-15, 1979 a seminar was held to provide a forum for an examination of the findings of that study, and also for discussion of present driver training and licensing procedures and possible changes that could be made to improve the standard of driving on New Zealand roads. This publication contains the papers and discussions from the following seminar sessions: A. Accident exposure; B. Testing procedures; C. Training programmes 1; D. Training programmes 2; E. Evaluation; F. Proposed changes; G. Research; and H. Panel discussion.

Road Traffic Safety Research Council, New Zealand   Proceeding HS-032 634, 1979, 312p, Figs., Tabs., Refs.

Acknowledgment: National Highway Traffic Safety Administration
Order From: Road Traffic Safety Research Council, New Zealand, P.O. Box 4140, Wellington, New Zealand

361615

SINGLE VARIABLE TABULATIONS FOR FATAL 1976-1980 NORTH CAROLINA ACCIDENTS

The tables in this reference document were generated from HSRC data tapes of accidents occurring in North Carolina from 1976 through 1980. Only accidents involving a fatality were used. An introduction to this document explains accident definitions and reporting procedures, gives the characteristics of the tables which make up the body of this document, and provides a detailed explanation of the HSRC accident tapes.

Hamilton, EG
North Carolina University   HS-032 638, June 1981, v.p., 3 App.

Acknowledgment: National Highway Traffic Safety Administration
Order From: North Carolina University, Highway Safety Research Center, Chapel Hill, North Carolina, 27514

361616

THE SEARCH FOR ZERO DEFECTS. DETROIT LOOKS FOR THE SECRET OF BUILDING HIGH-VALUE CARS

The rate of recovery, for the U.S. auto industry, is slower than ever before. This article addresses the reasons for this slump, and most particularly the reason why American cars don't seem to be as well-made as German and Japanese cars. Management and workers' attitudes in Germany, Japan and the U.S. are compared, and the willingness of American car manufacturers to change and try to build high-quality cars once more, is discussed.

Gregory, FMH *Motor Trend* Vol. 33 No. 5, HS-032 631, May 1981, pp 108-110, Phots.

Acknowledgment: National Highway Traffic Safety Administration
Order From: Petersen Publishing Company, 8490 Sunset Boulevard, Los Angeles, California, 90069

361751

WHAT TO DO WITH THE DWI OFFENDER: A QUESTION OF ATTITUDES

This article addresses the problem of the DWI offender and what should be done about it. An appeal is made to everyone to examine their attitudes about forced responsibility and misplaced kindness. It is pointed out that the typical DWI offender is not a social drinker who drives while drunk, but a problem drinker whose addiction to alcohol involves a progressive loss of control and repeated alcohol-related trouble in his life. Our legal system has an effective motivation tool in the desire of the defendant with alcoholism to keep his driving privileges and his freedom, but as long as our attitudes prevent us from exerting forced responsibility, all our efforts to reduce the tragic consequences of DWI are doomed.

Barni, E *Traffic Safety* Vol. 81 No. 4, HS-032 678, July 1981, p 6

Acknowledgment: National Highway Traffic Safety Administration
Order From: National Safety Council, 444 North Michigan Avenue, Chicago, Illinois, 60611

361752

WHERE STATE GOVERNMENTS STAND ON CHILD RESTRAINT LEGISLATION

This article reports the results of a survey of state legislatures on child restraint legislation. Information is also included on state 55 mph legislation. Most of the child restraint legislation introduced deals with four main issues: (1) the age and weight of the child; (2) the position in the motor vehicle where safety seats must be used; (3) to whom and under what circumstances the laws apply; and (4) sanctions, if any, for violations. The major portion of this article addresses these four issues and in conclusion the benefits of child restraint legislation are examined in light of the current anti-regulatory mood.

Hurley, C *Traffic Safety* Vol. 81 No. 4, HS-032 680, July 1981, pp 10-14

Acknowledgment: National Highway Traffic Safety Administration
Order From: National Safety Council, 444 North Michigan Avenue, Chicago, Illinois, 60611

361753

WET WEATHER ACCIDENTS AND PAVEMENT SKID RESISTANCE

This article reviews the problems in relating pavement skid resistance to accidents. It shows that the failure to agree on minimum skid resistance requirements is not because of a lack of effort. A friction potential is defined and a hypothetical relationship is suggested which, it is hoped, will stimulate discussion and generate sufficient interest to test the hypothesis in future research studies.

Hegmon, RR *Public Roads* Vol. 45 No. 2, HS-032 676, Sept. 1981, pp 68-74, 2 Fig., 26 Ref.

Acknowledgment: National Highway Traffic Safety Administration
Order From: Federal Highway Administration, Office of R&D, 400 7th Street, SW, Washington, D.C., 20590

361754

A VIABLE ALTERNATIVE TO HIGHWAY SAFETY FUNDING SANCTIONS

This article presents a brief review of the history of imposed sanctions upon states which failed to comply with Federal safety regulations. It is then pointed out that current sanction imposition is based upon the "microscopic" premise whereby if an element has proven itself worthy for inclusion into the Highway Safety Program, it must be maintained or sanctions must be applied. Another evaluative tool is proposed. This technique is called "macroscopic" analysis and refers to the determination of the relative value of an overall program before the ascertainment of the values of its contributary parts. Using the FHWA annual report of highway classification fatalities and rates as well as injury accidents and rates (mandated since 1967), a scenario is created. In conclusion, it is stated that to correct deficiencies identified by this technique, local funding reapportionment could be applied rather than threat of withholding funds.

Geurts, CA (Utah Department of Transportation) *ITE Journal* Vol. 51 No. 10, HS-032 675, Oct. 1981, pp 23-25, 2 Fig.

Acknowledgment: National Highway Traffic Safety Administration
Order From: Institute of Transportation Engineers, 525 School Street, SW, Suite 410, Washington, D.C., 20024

361755

THE VALIDITY OF A REVISED VERSION OF THE MORTIMER-FILKINS TEST WITH IMPAIRED DRIVERS IN OSHAWA, ONTARIO

This study attempted to relate Mortimer-Filkins classifications to those based on the CRIT, an external criterion that measures the extent of a drinking problem. The test scores examined were those of 78 persons in a program for drivers charged with 2 or more alcohol-related traffic offenses in Oshawa, Ontario. The correspondence between test scores and the problem drinker classification of the CRIT indicated a satisfying degree of discrimination.

Ennis, P Vingilis, E *Journal of Studies on Alcohol* Vol. 42 No. 7, HS-032 670, July 1981, pp 685-688, 1 Tab., 4 Ref.

Acknowledgment: National Highway Traffic Safety Administration
Order From: Addiction Research Foundation, Dr Vingilis (Evelyn), 33 Russell Street, Toronto, Ontario M5S 2S1, Canada

361756

SOMEONE DOESN'T WANT YOU TO HAVE THE CAR OF YOUR DREAMS, AND IT ISN'T THE UNITED STATES GOVERNMENT

In 1970, the Clean Air Act was amended to prohibit the importation of any post-1968 automobile that does not meet federal specifications, except for racing cars, test cars and show cars. This meant that for ordinary citizens' importation was impossible unless he was willing to spend up to $20,000 beyond the price of the car to bring it into compliance with federal regulations. Yet, despite the cost and hassle, 1400 cars are brought in and certified each year. In the July 21, 1980 Federal Register, EPA published a proposed change of rule: cars could no longer be imported subject to later certification (except for racing cars etc.), but individuals would be granted a one-time exemption to bring in an uncontrolled car for personal use. This proposal applies to emissions only, and the car would still have to meet all safety regulations. At the hearing, on November 3, 1980, of the eleven people who showed up, only one spoke in favor of the proposal. All the rest, independent American businessmen spoke against the new rule, claiming that they would loose the sales of these imported cars to individuals bringing in European models. At the time this article is written, EPA is still weighing more than 500 written comments from enthusiastic individuals who see a chance to get the car of their dreams, but the word from a few of the businessmen is that the fix is in: there will be no change in the rules.

Bedard, P *Car and Driver* Vol. 27 No. 3, HS-032 642, Sept. 1981, pp 79-83

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: Ziff-Davis Publishing Company, 1 Park Avenue, New York, New York, 10016

361757

TRANSPORTATION SAFETY BOARD ANALYZES VEHICLE COLLISIONS WITH TREES

This article reviews the National Transportation Safety Board's recent report entitled "Special Study-- Motor Vehicle Collisions with Trees Along Highways, Roads and Streets: An Assessment." It points out some interesting data on this type of accident and includes a list of states giving the number and percentages of fatalities resulting from collisions with trees (1975-1979). Also presented are the board's 12 conclusions and 4 recommendations.

Traffic Safety Bulletin Vol. 2 No. 4, HS-032 659, Sept. 1981, pp 6-7

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: Institute for Traffic Safety Management & Research, 260 Washington Avenue, Albany, New York, 12210

361758

TIME-COURSE EFFECTS OF MODERATE LEVELS OF CANNABIS ON HUMAN PSYCHOMOTOR PERFORMANCE

This experiment examined the ability of ten male subjects, aged 18-30, to perform a psychomotor task at eight selected intervals over a 22-hour period after smoking up to two marihuana cigarettes. Data were obtained, using an on-line computer system, on each subject's ability to perform the critical tracking task, which is a compensatory tracking task with unstable error dynamics. The target drug dose was a maximum of 150 micrograms tetrahydrocannabinol (THC) per kilogram body weight, which is considered to be a moderately high social dose at the rate that the THC was ingested. Subject performance was examined at times 30 and 45 minutes, and 1,2,3,4,5 and 22 hours after smoking. Analyses of the data suggest that psychomotor performance is affected long after the plasma level of delta-9-THC, the active ingredient in marihuana, has fallen. The results suggest, therefore, that performance is a function of some combination of the parent THC compound and its major metabolites.

Attwood, DA McBurney, LJ Bobbie, BA Clowes, MA
Transport Canada Research and Development Centre Tech Memo HS-032 654, 1981, 14p, 1 Fig., Refs.

Prepared for the 14th Annual Meeting of the Human Factors Association of Canada, Toronto, Ontario, October, 1981.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: Transport Canada Research and Development Centre, Road Safety Unit, Montreal, Quebec H3A 2R3, Canada

361759

TEENAGE DRIVERS AND MOTOR VEHICLE DEATHS. PRELIMINARY REPORT

Motor vehicles account for nearly half the deaths of 16-19 year olds in the United States. Teenage drivers contribute substantially to motor vehicle related deaths, both their own and others. Teenage drivers have greatly elevated rates of fatal crash involvement per capita and especially, per licensed driver. More deaths per licensed driver are associated with the passenger vehicle crashes of 18 year olds than for any other age. Deaths per licensed driver are next highest for 16, 17, and 19 year olds. Various possible ways to reduce the deaths that result from teenagers driving are discussed, including raising the minimum age of licensure to age 18. In 1978, passenger vehicle drivers 16 and 17 years old were in crashes that resulted in 4,198 deaths.

Karpf, RS Williams, AF
Insurance Institute for Highway Safety HS-032 651, Sept. 1981, 24p, 11 Fig., 13 Ref.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: Insurance Institute for Highway Safety, Watergate 600, Washington, D.C., 20037

361760

SPECIAL STUDY: RAILROAD/HIGHWAY GRADE CROSSING ACCIDENTS INVOLVING TRUCKS TRANSPORTING BULK HAZARDOUS MATERIALS

The National Transportation Safety Board has studied accident data collected by four other Federal agencies, has investigated 14 accidents involving train collisions with trucks transporting hazardous materials, and as a result has determined certain characteristics of such collisions. An average of 62 accidents of this type occur annually, resulting in an average of more than 1.6 million dollars property damage, 41 injuries, and 7 fatalities. Some recent individual accidents have involved fatalities and property damage in excess of previous yearly averages. One railroad's data when extrapolated suggest that there may be as many as 750 near-collisions between trains and trucks transporting bulk hazardous materials each year. The accidents tend to involve trucks transporting petroleum products and to occur close to distribution/storage terminals. A uniform effort, as an extension of Operation Lifesaver, which includes engineering, education, enforcement, and legislation, is needed to reduce these types of accidents. Additionally, changes in data systems are needed.

National Transportation Safety Board NTSB-HZM-81-2, HS-032 644, Sept. 1981, 49p, 4 Fig., 5 Tab., 2 App.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: NTIS

PB82-113432

361761

SUSTAINED VISUAL ATTENTION AND CARBON MONOXIDE: ELIMINATION OF ADAPTATION EFFECTS

Eighteen subjects performed a 1-h visual vigilance task, once during a control condition, (filtered air) and once during an experimental condition (CO). The COHb level was elevated to 5% utilizing a bolus maintenance technique which raised the COHb level rapidly so that there would be no possibility of an adaptation occurring prior to vigilance testing. Physiological measurements included heart rate, blood pressure, and ventilation. Neither vigilance performance nor the physiological variables was statistically affected by the 5% COHb level. Subjects identified a significantly (p less than 0.05) higher percentage of signals with the high frequency of signal presentation as compared to the low frequency under both filtered air and the 5% COHb level. Signal detection improved in 12 subjects during minutes 0-15, while 10 subjects showed improvement during minutes 31-45 with an elevated COHb level. The subjective questionnaire indicated that CO significantly (p less than 0.01) decreased the subjects' confidence concerning their performance on the vigilance task, as well as causing significant (p less than 0.05) irritation of the eyes and throat.

Roche, S Horvath, S Gliner, J Wagner, J Borgia, J *Human Factors* Vol. 23 No. 2, HS-032 643, Apr. 1981, pp 175-184, 3 Tab., Refs.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: California University, Santa Barbara, Dr Gliner (Jeffrey A), Institute of Environmental Stress, Santa Barbara, California, 93106

361762

SOME PROBLEMS ON TRAFFIC ACCIDENTS ANALYSIS

In order to consider countermeasures to prevent accidents through the elucidation of accidents, causes, I had the opportunity to investigate and to analyse accidents as a member of Study Group on Traffic Safety in Hokkaido. But it is not an easy task to grasp the actual state of accidents and to reenact them. Actual accident investigations are conducted by police detection and their reports. The investigations are very effectively and thoroughly conducted. This article refers to those investigation methods from an automobile engineering perspective, taking into consideration the re-enactment of accidents. To word this a little differently, discrepancies are apt to give rise between the parties as to when they perceive the danger, and their reported speeds and positions at the time of impact. I will explain here their background by taking some examples.

Horiuchi, K (Hokkaido Institute of Technology) *IATSS Research* Vol. 5 HS-032 641, 1981, pp 60-69, 13 Fig.

Acknowledgment: National Highway Traffic Safety Administration
Order From: International Association of Traffic & Safety Sci, 6-20, 2-chome, Yaesu, Chuo-ku, Tokyo 104, Japan

361763

THE UNECONOMIC CONSUMPTION OF AUTOMOBILE FUEL--ONE EXAMPLE

This paper deals with private automobiles and the fuel that is consumed in the process of moving across a political boundary. For this study, the Blaine/Douglas (Washington/British Columbia) border crossing was selected, and observations were taken to determine queue lengths, queueing time, and processing time on Friday, July 6, 1980 and Sunday, July 8, 1980. Data was gathered for vehicles crossing in both directions, on both days. The study indicates that during the two three-hour periods, some 500 U.S. gallons of gas were consumed by private automobiles while they waited to be cleared by customs and immigration services. The paper concludes by suggesting that some of the procedures which have been adopted by the European Common Market to facilitate the movement of persons and vehicles might well be adopted for crossing the U.S.-Canadian border and by thus doing, an enormous amount of fuel, which is currently wasted, could be saved.

Ruppenthal, KM Schillerstrom, K *Logistics and Transportation Review* Vol. 17 No. 3, HS-032 665, June 1981, pp 213-220, 1 App.

Acknowledgment: National Highway Traffic Safety Administration
Order From: British Columbia University, Canada, Faculty of Commerce, Vancouver V6T 1W5, British Columbia, Canada

361764

THE TRUCKING INDUSTRY IN THE UNITED STATES: A STUDY OF TRANSPORTATION POLICY IN TRANSITION

This article examines the process of legal and policy changes in the trucking industry. It is not an attempt to evaluate the desirability of deregulation, or the probable economic consequences of the recent changes in the law. Rather, it examines the regulatory process itself, analyzing the limits of the existing legal mechanisms and the various inputs and forces that determine legislative and policy change. Trucking reform is an extremely complex and emotional topic. The issues are numerous, the protagonists are many, and the process of change has been lengthy and quite vitriolic. This article examines the various interest groups involved, analyzes the specific issues, and looks at the substance of legal changes. This is followed by a description of relevant events since passage of the Motor Carrier Act of 1980. In conclusion, an attempt is made to evaluate the situation.

Rakowski, JP *Traffic Quarterly* Vol. 35 No. 4, HS-032 664, Oct. 1981, pp 623-637, 1 Tab.

Acknowledgment: National Highway Traffic Safety Administration
Order From: Eno Foundation for Transportation, Incorporated, P.O. Box 55, Saugatuck Station, Westport, Connecticut, 06880

361765

SPURIOUS SIGNALS. THE CONTROVERSY OVER POLICE RADAR

In the past thirty years, police radar has become the major tool for enforcing speed limits in most parts of the United States. At present, an estimated 60,000 police radars are in use nationwide accounting for the issuance of more than 30 million speeding tickets annually. One advantage of the use of radar is that until recently it has been readily accepted as prima facie evidence in most courts and this unique judicial status has resulted in a conviction rate of higher than 99% in speeding arrest. Only recently have attempts to question radar's infallibility met with some limited success. In the much-publicized Miami hearings, in Dade County, Florida in 1979, expert witnesses testified to a variety of potential sources of radar error, both functional and operational. This article reviews the court testimony, studies the proceedings of legislative hearings, interviews federal, state and local highway authorities, and analyzes the results from controlled tests of radar's effectiveness.

Tomerlin, J *Road and Track* Vol. 32 No. 9, HS-032 646, May 1981, pp 69-74, 12 Ref.

Acknowledgment: National Highway Traffic Safety Administration
Order From: CBS Consumer Publishing West, 1499 Monrovia Avenue, Newport Beach, California, 92663

361766

WHEN THEY SHAKE, WADDLE AND ROLL USE THESE VIBRATION STOPPING TIPS

Wheel unbalance causes 75% of highway speed vibration problems, however 25% of noise, vibration, and harshness (NVH) complaints are not directly related to that. Suspension movement can be caused by an out-of-round tire, tire stiffness variation (radial force variation), or a bent or out-of-round rim. Noise can be caused by axle gears, the pitch of exhaust gases as they rush through the exhaust system, roof racks on station wagons and small cars that can set up airfoil effects, trim moulding and grille assemblies, special tires, or engine accessory assemblies. Another cause of vibration encountered nowadays is low-speed driveline vibration caused by action of some automatic transmission lock-up converters. Procedures for identification and repair of these problems are given in this article, which also includes a chart "Representative rolling roughness diagnosis procedure", and a list and explanation of various words used to describe noise.

Carrier, H *Brake and Front End* Vol. 51 No. 9, HS-032 679, Sept. 1981, pp 18-22, 4 Fig.

Acknowledgment: National Highway Traffic Safety Administration
Order From: Babcox Publications, Incorporated, 11 South Forge Street, Akron, Ohio, 44304

361767

TROUBLE-SHOOTING FORD'S SOLID STATE IGNITION SYSTEM. PART 1

Since its introduction in 1974, the Solid State Ignition (SSI) system used in Ford, Mercury and Lincoln cars, and Ford trucks, has been modified several times. Trouble shooting involves testing the primary and secondary ignition systems and different procedures must be followed for variation in the system components. An extensive and illustrated explanation of these procedures is given.

Schultz, M *Popular Mechanics* Vol. 156 No. 1, HS-032 662, July 1981, pp 49-52

This is Part 1 of a 2-part article.

Acknowledgment: National Highway Traffic Safety Administration
Order From: Hearst Magazines, 224 West 57th Street, New York, New York, 10019

361768

TOWING

Trailering is complicated and has some very specific safety considerations. This article examines the safety side of trailering: cars and hitches, brakes and tires, trailer handling balanced loading, swaying, wet weather handling, ice and snow, following distances, passing and being passed, backing and the need to rest, as driving with a trailer requires more of the driver than ordinary driving. The article includes numerous photos and drawings, a chart "Classification of Trailer Hitches", a list of tools needed for trailering, and a checklist of things to do before you take off.

Driver Vol. 14 No. 12, HS-032 655, May 1981, p 1, Phots.

Acknowledgment: National Highway Traffic Safety Administration
Order From: GPO

361769

TRANSPORTATION SYSTEM MANAGEMENT, AIR QUALITY, AND ENERGY CONSERVATION

This Information Bulletin provides an overview of the principal issues faced by local government officials as they develop and implement TSM strategies to deal with transportation air quality, and energy problems at the local level.

Public Technology, Incorporated, Department of Transportation HS-032 660, Sept. 1980, 81p, 2 Fig., 8 Tab.

A Report of the Transportation Task Force of the Urban Consortium for Technology Initiatives.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: Public Technology, Incorporated, 1301 Pennsylvania Avenue, NW, Washington, D.C., 20004

361770

STATISTICAL SUMMARY OF TRAFFIC ACCIDENTS 1980

This report contains: (A) General Traffic Related Information; (B) 1980 General Traffic Accident Data; (C) Comparative Traffic Related Information for Previous Years and Similar Cities; (D) Traffic Enforcement in the District of Columbia: (E) Alcohol, Speed, and Pedestrian Enforcement; and (F) Traffic Safety Literature.

Metropolitan Police Department HS-032 649, 1980, 107p

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: Metropolitan Police Department, Traffic Analysis Unit, 501 New York Avenue, NW, Washington, D.C., 20001

361771

A UNIFORM TRANSIT SAFETY RECORDS SYSTEM FOR THE COMMONWEALTH OF VIRGINIA

This study was conceived as the first phase of a three-phase program to develop a safety data base for intracity bus transit. It involved reviewing the state of the art of general transportation safety management, examining the current intracity bus safety records systems of the federal, state, and local governments and the transit industry, and developing the basis for an intracity bus safety records system for the Commonwealth of Virginia. Definitions of motor bus traffic accidents, passenger accidents, and crime were developed; data elements and codes were selected; and an accident/incident report form was designed. Guidelines for developing data files, coding, entry, editing, and data processing procedures were developed along with recommendations on the development of the last two phases of the program.

Bowman, MA
Virginia Highway & Transportation Research Council VHTRC 81-R39, HS-032 666, Feb. 1981, 66p, 8 Fig., 13 Tab., Refs., 9 App.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: Virginia Highway & Transportation Research Council, P.O. Box 3817, University Station, Charlottesville, Virginia, 22903

361772

TRANSIENT DIRECTIONAL RESPONSE TEST PROCEDURES FOR AUTOMOBILES

Four tests for measuring the transient directional response of passenger cars were performed to evaluate their respective merits. The tests examined were (1) ramp-step steer test, (2) reverse steer, (3) lane change (sinusoidal steer), and (4) pseudo-random steer. The results show that each test is capable of contributing useful information concerning the transient directional response of the vehicle in specific operating scenarios. In addition, the findings indicate that no single test provides an accurate means for assessing the results obtained from the other test procedures. Hence a combination of these test procedures is recommended for evaluating the steering response of passenger cars.

Nisonger, RL Fancher, PS
Highway Safety Research Institute, Motor Vehicle Manufacturers Assn of the U.S., Inc, (361906) Final Rpt. UM-HSRI-81-36, HS-032 657, July 1981, 90p, 25 Fig., 11 Tab., 11 Ref.
Contract

MVMA Proj 1149

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: Highway Safety Research Institute, Huron Parkway and Baxter Road, Ann Arbor, Michigan, 48109

361773

TRIP GENERATION OF VEHICLE-INTENSIVE COMMERCIAL LAND-USES. VOLUME 1 SUMMARY

This Bulletin reports the methodology and results of a detailed investigation of vehicle trip patterns and parking needs of three vehicle-intensive land-uses, namely wholesale liquor stores, fast-food stores and service stations. The poor relationship between trip rates and the number of employees or the floor area is discussed and the extension of the study, to incorporate various other factors (eg, catchment population, amount of passing traffic) related to the location of the land-use, is described.

Burgess, JM
National Roads Board, New Zealand RRU Bulletin 52, HS-032 661, 1981, 28p, Figs., Tabs.

Volume One is a summary report, with Volume Two providing more detailed information.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: National Roads Board, New Zealand, P.O. Box 12-041, Wellington, New Zealand

361774

THE USE OF HOSPITAL IN-PATIENT DATA IN THE ANALYSIS OF THE INJURIES SUSTAINED BY ROAD ACCIDENT CASUALTIES

This study aimed at compiling from existing hospital casualty records and police accident records a dataset containing information on the nature of injuries to road accident casualties and on the circumstances of the accident in which each casualty was injured. Hospital In-Patient Enquiry data and national police accident data, which comprise the source data, are described and their accuracy discussed. These records are anonymous. Consequently, matching casualty records in the two datasets was a matter of selecting the most likely match. The method of selecting matches is explained, and some of the difficulties involved discussed. It is estimated that about 50 percent of the hospital records can be readily matched and that less than 10 per cent of the matches are incorrect. The matched dataset derived from one year's data for almost the whole of Great Britain contains 3,800 accident records in which the circumstances of the accident, the vehicle involved, and the casualties from the accident are recorded. For each accident the location of the major injury and length of stay in hospital of one casualty are known. Some examples are given of the many analyses carried out to study the usefulness and limitations of data derived in this way in investigating the factors which influence the nature of injuries to casualties.

Nicholl, JP (University College, London)
Transport and Road Research Laboratory SR 628, HS-032 668, 1980, 57p, 8 Fig., 9 Tab., 23 Ref., 3 App.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: TRRL

361775

SWIRL PRODUCTION IN FOUR-STROKE ENGINE CYLINDER--ANALYSIS IN MOTORING OPERATION

A new method for predicting the swirl speed in an engine cylinder has been presented. The air jet issuing from the inlet valve is presumed to contribute to swirl production after impinging upon the cylinder wall and piston top surface. By applying also a velocity profile of turbulent plane wall-jet, it is possible to predict approximately the swirl speed and its velocity profile in an engine cylinder.

Tanabe, S Hamamoto, Y Ohigashi, S *JSAE Review* No. 4, HS-032 650, Mar. 1981, pp 35-41, 11 Fig., 6 Ref.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: Society of Automotive Engineers of Japan, Inc, 10-2 Goban-cho, Chiyoda-ku, Tokyo 102, Japan

361776

THEORETICAL AND EXPERIMENTAL STUDIES ON THE DYNAMIC PROPERTIES OF TYRES PART 2: EXPERIMENTAL INVESTIGATION OF RUBBER FRICTION AND DEFORMATION OF A TYRE

Experiments designed to determine the basic properties of a tyre needed for the calculation of the six components of force and moment are described. Similar consideration is then given to experiments aimed at determining the frictional properties needed for the calculation of the six components.

Sakai, H *International Journal of Vehicle Design* Vol. 2 No. 2, HS-032 653, May 1981, pp 182-226, 79 Fig., 3 Tab., 7 Ref.
For Part 1 see HS-031 882.

Acknowledgment: National Highway Traffic Safety Administration
Order From: Inderscience Enterprises Limited, La Motte Chambers, St Helier, Jersey, England

361777

PASSENGER CARS 1981 EDITION. VEHICLE INSPECTION HANDBOOK

This revision is an effort of the Vehicle Inspection Committee of the Motor Vehicle Manufacturers Association of the U.S., in cooperation with the Committee on Engineering and Vehicle Inspection of the American Association of Motor Vehicle Administrators. It continues to provide succinct descriptions of inspection procedures and objective statements of the grounds for rejecting passenger cars and station wagons. It is responsive to motor vehicle inspection requirements and to changes in vehicle design significant to motor vehicle inspection programs. This edition interprets the American National Standards Institute's "American National Standard Inspection Procedures for Motor Vehicles, Trailers, and Semitrailers Operated on Public Highways"-ANSI Standard D7.1. Also reflected are the National Highway Traffic Safety Administration's "Vehicle In Use Inspection Standards" (Title 49 CFR Part 570), and its amendments enacted, through those of Docket No. 73-9. This Handbook is not intended as a set of hard and fast rules, but as a guide for both the individual inspector and for the person responsible for planning and implementing a meaningful inspection program based on sound engineering principles. All or any part of the book may be used, or various parts may be absorbed into a program in stages.

Motor Vehicle Manufacturers Assn of the U.S., Inc, American Association of Motor Vehicle Admin HS-032 673, Apr. 1981, 40p

Acknowledgment: National Highway Traffic Safety Administration
Order From: Motor Vehicle Manufacturers Assn of the U.S., Inc, Vehicle Inspection Handbook, Technical Affairs Division, Detroit, Michigan, 48202

361778

TRUCK/BUS/SCHOOL BUS 1981 EDITION. VEHICLE INSPECTION HANDBOOK

This revision is an effort of the Vehicle Inspection Committee of the Motor Vehicle Manufacturers Association of the U.S., in cooperation with the Committee on Engineering and Vehicle Inspection of the American Association of Motor Vehicle Administrators. It continues to provide concise descriptions of inspection procedures and objective statements of the grounds for rejecting trucks, buses, and school buses. It is responsive to motor vehicle inspection requirements and to changes in vehicle design significant to motor vehicle inspection programs. This edition interprets the American National Standards Institute's "American National Standard Inspection Procedures for Motor Vehicles, Trailers, and Semitrailers Operated on Public Highways"-ANSI Standard D7.1. Also reflected are the National Highway Traffic Safety Administration's "Vehicle In Use Inspection Standards" (Title 49 CFR Part 570), and its amendments enacted, through those of Docket No. 73-9. This Handbook is not intended as a set of hard and fast rules, but as a guide for both the individual inspector and for the person responsible for planning and implementing a meaningful inspection program based on sound engineering principles. All or any part of the book may be used, or various parts may be absorbed into a program in stages.

Motor Vehicle Manufacturers Assn of the U.S., Inc, American Association of Motor Vehicle Admin HS-032 674, Apr. 1981, 40p

Acknowledgment: National Highway Traffic Safety Administration
Order From: Motor Vehicle Manufacturers Assn of the U.S., Inc, Vehicle Inspection Handbook, Technical Affairs Division, Detroit, Michigan, 48202

361779

WHAT A MOTORIST CAN DO TO MINIMIZE THE CHANCES OF BEING INVOLVED IN AN ACCIDENT

Traffic accidents result every year in over 50,000 fatalities and 4,000,000 injuries. Past research has identified the causal role of human errors in the majority of such accidents. This report briefly summarizes current knowledge of how human factors contribute to traffic accidents, and outlines preventive measures motorists can take to minimize their chances of being involved in an accident.

Sivak, M
Highway Safety Research Institute UM-HSRI-81-37, HS-032 677, July 1981, 12p, Refs.

Acknowledgment: National Highway Traffic Safety Administration
Order From: NTIS

PB81-236176

361907

AN APPRAISAL OF SAN DIEGO COUNTY SB-38 PARTICIPANT DUI RECIDIVISM AND TRAFFIC ACCIDENT INVOLVEMENT

Successful participation in the San Diego County SB-38 program appears to be as effective a countermeasure to subsequent DUIs (Driving Under the Influence offenses) as the otherwise mandated license suspension for second offenders. DUI survival rates were calculated for a sample of San Diego County SB-38 graduates for the year post program completion and compared with the survival rates calculated by DMV on individuals for the year post license suspension. The San Diego County group had higher DUI survival rates.

Ryan, BE Vasquez, JE *Abstracts & Reviews in Alcohol & Driving* Vol. 2 No. 8, HS-032 691, Aug. 1981, pp 3-5, 2 Tab., 1 Ref.

Acknowledgment: National Highway Traffic Safety Administration
Order From: UCLA Alcohol Research Center, Neuropsychiatric Institute, 760 Westwood Plaza, Los Angeles, California, 90024

361908

ANALYTICAL COMPARISON OF METHODS FOR ASSESSING THE TRANSIENT DIRECTIONAL RESPONSE OF AUTOMOBILES

This paper addresses the interpretation of data obtained from transient response tests currently used to evaluate the response to steering of highway vehicles. For the random input test, calculated results from a computerized model of a passenger car are used to demonstrate that (1) coulomb friction in the steering system tends to reduce the values of yaw rate and lateral acceleration coherence functions at frequencies less than 0.5 Hz and (2) the sideslip angle "transfer function" has interesting properties related to the amplitude of the steering input. Two phase planes, called the "angle plane" and "curvature plane," present results for step/ramp and sinusoidal input tests. The angle plan provides information concerning the slip angles occurring at the vehicle's front and rear tires. The curvature plan displays both the curvature of the path of the vehicle's center of gravity and the reciprocal of the distance from the center of gravity to the instantaneous center of rotation. Curvature plane results are used to provide a detailed summary of the response information fed back to a driver during an obstacle-avoidance maneuver.

Fancher, PS Nisonger, RL Winkler, CB Guo, K
Highway Safety Research Institute HS-032 696, 1981, 14p, 11 Fig., 15 Ref.
IAVSD Symposium, Cambridge, England, September 7-11, 1981.

Acknowledgment: National Highway Traffic Safety Administration
Order From: Highway Safety Research Institute, Huron Parkway and Baxter Road, Ann Arbor, Michigan, 48109

361909

HOW WE RESTORED LOUISIANA'S MOTORCYCLE HELMET USE LAW

In the summer of 1981, Louisiana became the first state in the nation to reinstate its mandatory motorcycle helmet use law when the state legislature passed a bill requiring motorcyclists of all ages to wear protective head gear beginning January 1, 1982. This article outlines the course of the struggle to reinstate the helmet use law. The lessons learned are summarized in a list entitled "Some Tips on Piloting Traffic Safety Bills Through State Legislatures."

Camel, NA (Safety Council of Greater Baton Rouge) *Traffic Safety* Vol. 81 No. 6, HS-032 692, Nov. 1981, p 6

Acknowledgment: National Highway Traffic Safety Administration
Order From: National Safety Council, 444 North Michigan Avenue, Chicago, Illinois, 60611

361910

WILL FUTURE TIRES BE CAST POLYURETHANE?

Testing has shown liquid injection molded (LIM) tires to be comparable to bias ply and radial ply tires; they are generally a compromise between the two for some types of performance testing. This article reports the results of various performance tests of the LIM tire. Dynamic tests included tire rolling resistance, durability, endurance, and load carrying capacity, as well as others. Road tests included wet traction, dry traction, snow traction, tread wear, and aquaplaning, as well as others. Static tests were also conducted.

Automotive Engineering Vol. 89 No. 4, HS-032 682, Apr. 1981 pp 55-59, 5 Fig.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: SAE

361911
WHY PARENTS DO NOT PROVIDE AUTOMOBILE RESTRAINTS FOR THEIR CHILDREN

If children in cars were adequately restrained many deaths and injuries would be prevented. Currently in New Zealand only 17% of children 0-8 years are appropriately restrained. Questionnaires about child car restraints were completed by 3,288 mothers who had a child 0 to 8 years of age. Eighty-six percent of the mothers drove at least twice a week while the child was with them. Overall, 52% claimed to always or usually use some form of approved child car restraint. The numbers varied with the age of the child. The reasons parents gave for not using a child car restraint could be placed in 2 groups--those which could be changed through altering public attitudes (58%), and those which suggest a need for co-operation between government, car manufacturers and car seat manufacturers (42%). A significant association (P less than 0.001) was found between people who claimed to use restraints and those who favoured the compulsory use of restraints.

Geddis, DC (Plunket Society) Spears, GF (Otago University) *Australian Paediatric Journal* Vol. 16 No. 2, HS-032 681, 1980, pp 114-116, 4 Tab., 11 Ref.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: Royal Children's Hospital, Editorial Office, Flemington Road, Parkville, Victoria 3052, Australia

361912
A COMPARISON OF THE CRASH EXPERIENCE OF UTILITY VEHICLES, PICKUP TRUCKS AND PASSENGER CARS

The purpose of the present study is to examine in detail the crash experience of leading utility vehicle models to determine the extent to which there are variations in their crash experience and whether specific models appear to have particular problems, such as high rollover accident rates. This study focuses on the three leading utility vehicles--the AMC Jeep CJ-5, the Ford Bronco and the Chevrolet Blazer--that represent well over half of the utility vehicles currently in use. For the Jeep CJ-5 the model years studied were 1972 to 1978; for the Chevrolet Blazer, 1973 to 1978 (prior to the 1973 model the Blazer was smaller); and for the Ford Bronco, 1972 to 1977 (the 1978 and later model Broncos were larger). For comparison purposes, the crash experience of a number of leading small (half-ton) pickup truck models was used. These were the Ford F-100 and F-150, the Chevrolet C-10 and K-10, and the smaller Toyota and Datsun pickup trucks. In addition, the crash experience of four passenger car size groups--subcompacts, compacts, intermediate, and full-sized--was examined. The overall crash experience of these vehicles in Maryland and in North Carolina, together with the national fatal crash experience as recorded by FARS (the Fatal Accident Reporting System), were studied.

Reinfurt, DW Li, LK Popkin, CL O'Neill, B Burchman, PF Wells, JK
North Carolina University, Insurance Institute for Highway Safety HS-032 687, Sept. 1981, 54p, Figs., 14 Tab., Refs., 2 App.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: North Carolina University, Highway Safety Research Center, Chapel Hill, North Carolina, 27514

361913
DESCRIPTIVE PARAMETERS USED IN ANALYZING THE BRAKING AND HANDLING OF HEAVY TRUCKS. INERTIAL PROPERTIES OF COMMERCIAL VEHICLES--VOLUME 2

This volume is one of a set of five volumes being prepared under support from the Motor Vehicle Manufacturers Association. The set of volumes is entitled "Descriptive Parameters Used in Analyzing the Braking and Handling of Heavy Trucks." The volumes address the acquisition of data on (1) steering and suspension systems, (2) inertial properties, (3) tires, (4) brakes, and (5) antilock systems. This volume, Volume 2, provides example data and describes devices that can be used to measure inertial properties. It also describes the HSRI Pitch Plane Inertial Properties Facility, gives pitch plane data for over 30 heavy vehicles, discusses additional inertial measurement techniques, provides data in all 3 planes for a limited number of heavy vehicles, and describes measurements of the inertial properties of vehicle components such as axles and wheels.

Winkler, CB
Highway Safety Research Institute, (361912) Final Rpt. UM-HSRI-81-19-2, HS-032 688, Apr. 1981, 25p, 10 Fig., 3 Tab.
Contract

MVMA Proj 1196

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: Highway Safety Research Institute, Huron Parkway and Baxter Road, Ann Arbor, Michigan, 48109

361914
ALCOHOL AND HIGHWAY SAFETY

Epidemiological and experimental studies indicate that alcohol-impaired drivers are a cause of a large number of traffic crashes. It is estimated that such crashes generate costs to society in the order of $10 billion or more. Society has responded to the alcohol-crash risk by using a variety of approaches. Chief among them is the legal approach that is based on deterrence: the threat of punishment is used to prevent individuals from driving while impaired. Other approaches, including health, public information and education, and technology, complement the traditional legal approach, and these are often used simultaneously. However, society's efforts to control the risk of drinking driving generally have not had much of an effect on the problem. This paper identifies the alcohol-crash risk, describes society's principal strategies and tactics for reducing this risk, discusses the relative success of these efforts, and presents recommendations for appropriate action against the problem of the drinking driver.

Joscelyn, KB Jones, RK Ruschmann, PA
Highway Safety Research Institute UM-HSRI-81-53, HS-032 694, Mar. 1981, 27p, 10 Fig., 7 Tab.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: Highway Safety Research Institute, Huron Parkway and Baxter Road, Ann Arbor, Michigan, 48109

361915
ALCOHOL, DRUGS, AND TRAFFIC LAW

Society's primary strategy for managing the safety risks posed by the impaired driver is the legal approach based on the principle of deterrence. Laws prohibiting impaired driving and calling for the punishment of offenders exist in all states. Implied-consent laws that assist the police in gathering evidence of impaired-driving offenses also exist in every state. However, many aspects of current state legislation are inadequate and inhibit law enforcement, especially with respect to drivers who are impaired by drugs other than alcohol. Many of these deficiencies can be remedied by legislative changes. This paper examines the chief legal tools directed against the impaired driver, describes major constraints on law enforcement, identifies the principal deficiencies of existing impaired-driving and implied-consent laws, and presents proposals for amending deficient laws.

Joscelyn, KB Ruschmann, PA
Highway Safety Research Institute UM-HSRI-81-48, HS-032 695, Mar. 1981, 22p, 4 App.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: Highway Safety Research Institute, Huron Parkway and Baxter Road, Ann Arbor, Michigan, 48109

361916
DRUGS AND HIGHWAY SAFETY

Not enough is known yet about the drug and driving problem to define its magnitude precisely and support countermeasure development. Research required to define the drug and driving problem more precisely and develop more effective countermeasures has been hampered by the complexity and variety of available drugs, and by the lack of analytic capability, funding, and coordination of effort. Nonetheless, a series of near-term strategies can be carried out by units of state and local government. Deficient state laws should be amended. Vigorous prosecution of impaired drivers using behavioral and other available evidence should continue, and nontherapeutic drug users who choose to drive while impaired should receive license sanctions. The health/legal approach should be used to find and treat offenders with underlying drug abuse problems. Public information and education efforts should focus on health care professionals and both therapeutic and recreational drug users. Short-term, poorly controlled, poorly coordinated research should be avoided; future research should focus on rigidly controlled, large-scale epidemiologic studies of crashed and noncrashed drivers, and of human performance while under drug influence. This paper is a guide for action by policymakers at the state and local level. It provides a series of strategies directed at controlling the drug-crash risk--strategies that can be implemented by state and local units of government in the near-term future.

Joscelyn, KB Donelson, AC Ruschmann, PA
Highway Safety Research Institute UM-HSRI-81-50, HS-032 702, Oct. 1981, 45p, 3 Fig.

Acknowledgment: National Highway Traffic Safety Administration
Order From: Highway Safety Research Institute, Huron Parkway and Baxter Road, Ann Arbor, Michigan, 48109

361917
NHTSA REPORT
In this speech given at the International Symposium on Occupant Restraint, Mr R.A. Peck, Jr, Administrator, National Highway Traffic Safety Administration (NHTSA), outlines the approach that the agency is going to take on public safety on the highways. NHTSA is going to undertake a massive public information and education campaign, involving both public and private organizations to include motor vehicle manufacturers, the insurance industry, health care providers automobile dealers, civic safety groups and others. The basic thrust of this campaign is going to be toward the use of active seat belts. One critical aspect of occupant restraint deals with the proper use of child restraint devices. Mr. Peck cites the case of Tennessee, which in 1977 adopted the first child restraint law in the United States, and Australia which enacted mandatory seat belt legislation in 1970.

Peck, RA, Jr (National Highway Traffic Safety Administration) *AAAM Quarterly Journal* Vol. 3 No. 4, HS-032 713, Oct. 1981, pp 14-16

Acknowledgment: National Highway Traffic Safety Administration
Order From: American Association for Automotive Medicine, P.O. Box 222, Morton Grove, Illinois, 60053

361918
THE PHYSICIAN'S ROLE IN HIGHWAY SAFETY--REPORTING REQUIREMENTS
This article examines the issue of the physician's responsibility with regard to the reporting of a patient's fitness or competence to drive. As of 1980, nine states required the reporting of physical/mental/medical impairments to driving by physicians, and five other states permitted rather than required such reporting. The most tenable argument raised by physicians in excusing or justifying their reluctance or failure to report their patients has been the apparent violation of the confidential physician-patient relationship. This argument is answered by the Uniform Vehicle Code which grants immunity from civil liability or prosecution for any physician who submits reports on his/her patients in compliance with the law. Many court cases dealing with this issue are cited throughout this article as it continues to examine the various questions that arise, such as what legal recourse may be had against a physician for failing to report or should a physician also be responsible for informing all potential victims who might be injured by his/her patient while that patient is driving.

Gregory, DR (Veterans Administration) *AAAM Quarterly Journal* Vol. 3 No. 4, HS-032 717, Oct. 1981, pp 29-33, 1 Tab., 22 Ref.

Acknowledgment: National Highway Traffic Safety Administration
Order From: American Association for Automotive Medicine, P.O. Box 222, Morton Grove, Illinois, 60053

361919
THE DILEMMA OF THE MONOCULAR DRIVER
This brief article examines the case of the monocular driver seeking to be licensed for Class I professional driving such as school buses, public transportation, and emergency vehicles from the point of view of the clinical physician. Weighing circumscribed and even conflicting research against sound clinical judgment, it is concluded that the monocular driver should not be licensed for Class I professional driving.

Keeney, AH Garvey, J *AAAM Quarterly Journal* Vol. 3 No. 4, HS-032 700, Oct. 1981, pp 34-35, 13 Ref.

Acknowledgment: National Highway Traffic Safety Administration
Order From: American Association for Automotive Medicine, P.O. Box 222, Morton Grove, Illinois, 60053

361920
THE COSTS OF DRUNK DRIVING
This article presents a hypothetical case study of the fines and penalties incurred for the conviction of drunk driving. Since fines and penalties for drunk driving vary widely across the country, the figures presented are localized, and are only for purposes of illustration. The final part of this article presents a discussion of the Blood Alcohol Level and includes a chart showing how much a person can drink, based on the amount a person drinks, the time interval and the person's body weight.

Driver Vol. 15 No. 6, HS-032 701, Nov. 1981, p 1

Acknowledgment: National Highway Traffic Safety Administration
Order From: GPO

361921
ECONOMIC IMPACTS OF TRANSPORTATION RESTRAINTS
Many cities are implementing restraints to discourage or restrict automobile use, especially in downtown areas. There is, however, concern among private businesses and local and regional government officials over the economic consequences of such actions. The major concerns raised by local elected and appointed officials in cities and counties with populations of 500,000 or more relate to the effects of traffic restrictions on local businesses, on an area's tax base, and on traffic and business outside a restricted zone. This Information Bulletin addresses these concerns by discussing the following issues: the diversity of restrictions now in use in U.S. cities; the known effects of transportation restrictions on economic, business, commercial, and recreational activities; information gaps; and the need for further work.

Public Technology, Incorporated, Department of Transportation HS-032 703, Sept. 1980, 34p, 1 Fig., 4 Tab.

A Report of the Transportation Task Force of the Urban Consortium for Technology Initiatives.

Acknowledgment: National Highway Traffic Safety Administration
Order From: Public Technology, Incorporated, 1301 Pennsylvania Avenue, NW, Washington, D.C., 20004

361922
PEDESTRIAN SAFETY
Competition between vehicles and pedestrians continues to result in pedestrian accidents, deaths, and injuries. Pedestrian fatalities represent 16% of all motor vehicle fatalities. Pedestrian safety programs vary between jurisdictions in organization and emphasis. Approaches to the basic issue of pedestrian safety also range widely--from separating pedestrians completely from vehicle traffic, through educating and encouraging pedestrians to obey safety laws, to making drivers aware of actions they can take to reduce pedestrian accidents. The common problem, however, is how best to reduce the pedestrian accident rate. This Information Bulletin addresses this problem by discussing the following areas: common types of pedestrian accidents; basic countermeasures; planning for pedestrians; pedestrian safety programs; and federal funding for pedestrian safety programs.

Public Technology, Incorporated HS-032 716, Sept. 1980, 49p, 3 Tab., 1 App.

Report of the Transportation Task Force of the Urban Consortium for Technology Initiatives.

Acknowledgment: National Highway Traffic Safety Administration
Order From: Public Technology, Incorporated, 1301 Pennsylvania Avenue, NW, Washington, D.C., 20004

361923
RADAR BRAKES: LOOKIN' GOOD!
The Preston Trucking Company is testing a truck-mounted radar safety device that could save hundreds of lives a year. The author of this article took a test drive in one of Preston's tractor-trailers equipped with the Rashid Safety System. He reports that on a narrow highway, with oncoming traffic just a few feet to the left, the beam was so precise that only objects directly in front of the tractor-trailer triggered the in-cab light and buzzer. Since the radar beam is regulated by vehicle speed, the faster the tractor-trailer

traveled, the further the beam was projected down the road. The beam was also precise enough to pick up the tail end of an automobile protruding from the side of the highway. Excerpts from a driver's daily report indicate further advantages of this radar safety system.

Owner Operator Vol. 11 No. 6, HS-032 719, Nov. 1981, pp 38-40, Phots.

Acknowledgment: National Highway Traffic Safety Administration
Order From: Chilton Company, Chilton Way, Radnor, Pennsylvania, 19089

361924

AN INVESTIGATION OF TRUCK SIZE AND WEIGHT LIMITS

This study applied a systematic investigation of the range of benefits and costs to the U.S. economy and society as a whole, as well as to individual interest groups, resulting from a set of alternative changes to current Federal limits on truck size and weight. The ten alternatives, or "scenarios," that were examined consist of a Base Case and five categories of changes in current Federal truck size and weight limits. A broad range of increases and decreases in limits are covered. The results of this analysis show that transport cost savings (from improved truck productivity) could overwhelm the associated costs of increased highway and bridge wear and tear and truck accident costs. The analysis also shows relatively little diversion of traffic from rail to truck.

Office of the Secretary of Transportation Final Rpt. HS-032 708, Aug. 1981, v.p., 9 App.

Report of the Secretary of Transportation to the United States Congress pursuant to Section 161 of Public Law 95-599, the Surface Transportation Assistance Act of 1978.

Acknowledgment: National Highway Traffic Safety Administration
Order From: GPO

361925

AN INVESTIGATION OF TRUCK SIZE AND WEIGHT LIMITS. APPENDICES TO THE FINAL REPORT

This volume contains nine appendices which present supporting material for the Secretary of Transportation's truck size and weight report to Congress as required by Section 161 of the Surface Transportation Assistance Act of 1978.

Office of the Secretary of Transportation HS-032 709, Aug. 1981, v.p.

Report of the Secretary of Transportation to the United States Congress pursuant to Section 161 of Public Law 95-599, the Surface Transportation Assistance Act of 1978.

Acknowledgment: National Highway Traffic Safety Administration
Order From: GPO

361926

MANAGING THE SPEED CRASH RISK

The driving error of improper speed has been identified as a leading cause of traffic crashes and associated losses. Excessive speed is particularly prevalent in fatal and other serious crashes. Society has taken formal action to control the crash risk posed by speeding; the earliest such response and the one most used today is the legal approach that rests on the concept of deterrence. In most jurisdictions criminal or criminal-like procedures are used to enforce speeding laws: police officers are deployed to observe for speeders; suspected violators are pursued and apprehended; and offenders are referred to judicial or administrative tribunals to determine guilt or innocence. A variety of patrol configurations, vehicles, and speed-measuring devices (chiefly radar) are used by police agencies to enforce speeding laws. Speed enforcement as currently carried out is labor intensive and costly, principally because legal requirements stemming from the use of criminal law and procedures must be followed. For traditional enforcement procedures to effectively deter speeding, large increases in funds and personnel would be required. Therefore, strategies other than the legal approach for managing the speed crash risk should be considered.

Ruschmann, PA Joscelyn, KB Treat, JR
Highway Safety Research Institute UM-HSRI-81-49, HS-032 710, Oct. 1981, 52p, Figs., Tabs.

Acknowledgment: National Highway Traffic Safety Administration
Order From: Highway Safety Research Institute, Huron Parkway and Baxter Road, Ann Arbor, Michigan, 48109

361927

MANAGING THE TRAFFIC CRASH RISK

Traffic crashes result in thousands of fatalities and billions of dollars in losses annually, and constitute a leading public health and safety problem. Society has responded to this problem by spending large sums of money and employing many people in traffic-safety programs; however, these efforts have been unguided by any well-developed body of theory. Prevailing highway safety theory has focused on the crash event itself, to the exclusion of more remote but nonetheless important factors that lead to traffic crashes. More effective management of the social risks posed by traffic crashes requires development of a body of theory that accounts for the role of society and its systems in managing social risks such as traffic crashes. A conceptual framework applying societal risk-management systems to the disutilities produced by the Highway Transportation System is presented. The conceptual framework applies concepts drawn from the disciplines of systems analysis and risk management. It is presented to describe the highway safety process and to provide the basis for further development of highway safety theory. Strategies for further research in highway safety based on the conceptual framework are described, and directions for further activity within the highway safety field are identified.

Joscelyn, KB Jones, RK
Highway Safety Research Institute UM-HSRI-81-51, HS-032 711, Oct. 1981, 90p, Figs.

Acknowledgment: National Highway Traffic Safety Administration
Order From: Highway Safety Research Institute, Huron Parkway and Baxter Road, Ann Arbor, Michigan, 48109

361928

OCCUPANT RESTRAINTS AND TRAFFIC CRASH LOSS REDUCTION

Automobile seat belts, child restraints, and motorcycle helmets have the demonstrated potential to prevent fatalities, reduce the severity of injuries, and reduce overall losses associated with traffic crashes. Modern restraints are inexpensive, widely available, and minimally inconvenient to the user, yet in spite of these attributes, most American travelers fail to take advantage of them. This is especially true with respect to seat belts and child restraints in passenger cars, where usage rates have consistently remained below 20 percent. Many nations have responded to the problem of nonuse of restraints by enacting laws requiring their use. Belt-use laws, which are common in Europe, Canada, and Australia, have not, so far, been politically feasible in the United States. Nevertheless, policymakers in both the public and private sectors have at their disposal a wide range of strategies other than comprehensive, mandatory belt-use laws. Legislation requiring certain classes of operators or occupants, especially motorcyclists and small children, to use restraints, enjoys popular acceptability. Regulations requiring restraint use while performing governmental business, and similar on-the-job regulations in private industry, are increasingly common. Information and education programs, directed at the general public and at such intermediate audiences as employers, physicians, and schoolteachers, may increase restraint use over a long period of time. Economic incentives for individuals who use restraints, or for those who actively promote restraint use by others, may lead to increased usage. This paper presents some promising alternatives to mandatory belt-use legislation that can be implemented in the immediate future to reduce traffic crash losses.

Ruschmann, PA Treat, JR Joscelyn, KB
Highway Safety Research Institute UM-HSRI-81-52, HS-032 715, Oct. 1981, 39p, Figs., Tabs.

Acknowledgment: National Highway Traffic Safety Administration
Order From: Highway Safety Research Institute, Huron Parkway and Baxter Road, Ann Arbor, Michigan, 48109

361929

1980 CRC OCTANE NUMBER REQUIREMENT SURVEY

In the 24th annual statistical survey of current model vehicles conducted by the Coordinating Research Council, Inc., test data were obtained on 429 1980 model vehicles including 6 select models of special interest. Maximum octane number requirements under full-and part-throttle operating conditions were determined, and surface ignition knock and rumble, if present, were also reported. Passenger cars and light-duty trucks including non-commercial vans (1/2-3/4 ton without four-wheel drive) were tested according to a weighted distribution. This year's survey includes analyses for the following vehicle categories: (1) U.S. and Imported Vehicles--429 vehicles;

(2) U.S. and Imported Cars--407 cars; (3) U.S. Vehicles--344 vehicles; (4) U.S. Cars--326 cars; and (5) Imported Vehicles--85 vehicles. It should be noted that the term "cars" designates passenger cars only, while the term "vehicles" includes passenger cars plus vans and light-duty trucks. The order of testing reference fuels was the same as the 1979 Survey, which is as follows: (1st) Tank Fuel; (2nd) High Sensitivity Full-Boiling Range Unleaded (FBRSU) Fuels; (3rd) Average Sensitivity Full-Boiling Range Unleaded (FBRU) Fuels; and (4th) Primary Reference (PR) Fuels. Seventeen laboratories participated in this survey and submitted data on U.S. vehicles; fourteen of these labs also reported data on imported models.

Coordinating Research Council, Incorporated CRC 519, HS-032 714, Jan. 1981, v.p., 23 Fig., 39 Tab., 10 App.

Participating laboratories are listed in Appendix A. Members of the CRC-Analysis Panel are identified in Appendix B. Prepared by the 1980 Analysis Panel of the CRC-Motor Octane Number Requirement Survey Group.

Acknowledgment: National Highway Traffic Safety Administration
Order From: Coordinating Research Council, Incorporated, 219 Perimeter Center Parkway, Atlanta, Georgia, 30346

361930
WYOMING TRAFFIC ACCIDENT FACTS 1980

This publication has been compiled to acquaint citizens and specific accident prevention organizations with traffic accident statistics in Wyoming. For the year 1980, a total of 17,222 accidents occurred on Wyoming's road system, which is a four and one-half percent decrease from 1979 totals. As a result, 6,822 persons were injured and 245 persons were killed, with traffic accidents resulting in an estimated ninety-two and one-half million dollar economic loss. Statistics are compiled from reports submitted by individuals involved in accidents, investigating officers from city police departments, sheriff offices and the Wyoming Highway Patrol. The estimates for accident costs were supplied by the National Safety Council.

Wyoming State Highway Department HS-032 686, 1980, 49p

Acknowledgment: National Highway Traffic Safety Administration
Order From: Wyoming State Highway Department, Highway Safety Branch, P.O. Box 1708, Cheyenne, Wyoming, 82001

361931
WYOMING'S FATAL ACCIDENT FACTS 1980

Fatal traffic accidents during 1980 totaled 205 involving 245 fatalities: an "average" year when compared to the years since 1976 which was Wyoming's worst year for fatal accidents. One of the more significant factors involved in fatal accidents during 1980 was the rise of alcohol related accidents, to 59% from a normal 50% level. The number of drivers in fatal accidents without a valid driver's license has increased for the third consecutive year. Economic loss for the 205 accidents is estimated to be nearly 47 million dollars. Sources for the data contained in this report are: The individual's accident report, the investigating officer's accident report, and miscellaneous reports from state's motor-vehicle divisions and newspaper articles. The primary purpose of this report is to analyze the causative factors of fatal accidents and present them so that the Wyoming Highway Department as well as other responsible groups, agencies and individuals can develop programs leading towards one major goal: "The Reduction of traffic deaths in Wyoming". It is intended that all the information in the report pertaining to the fatal accidents which occurred during the calendar year 1980 be used solely for statistical and analytical purposes.

Wyoming State Highway Department HS-032 684, Apr. 1980, 57p

Acknowledgment: National Highway Traffic Safety Administration
Order From: Wyoming State Highway Department, Highway Safety Branch, P.O. Box 1708, Cheyenne, Wyoming, 82001

361932
WYOMING'S 1980 TRUCK ACCIDENT FACTS

During 1980 Wyoming truck-involved accidents decreased to 1760, a decrease of six percent over 1979. Truck accidents account for nearly 10% of the total traffic accidents for 1980, as they have historically in years past. Truck-involved accidents during 1980 include 46 fatalities and 788 injuries, a decrease from 74 fatalities and 901 injuries in 1979. The number of fatal truck accidents is the lowest in the last five years, including the lowest number of truckers killed since 1973; however, the percent of truck-involved accidents has been consistent, along with the same percentage of commercial vehicles on state highways. Since 50% of the truck accidents involve a collision with another motor vehicle and the size differential between trucks and late model cars has increased in recent years, the logical conclusion would be a higher number of fatalities in this accident type; however, the percentage of fatalities in this accident type decreased slightly in 1980. The data analyzed and presented in this report came from the individual's accident reports and the investigating officer's reports (city police departments, sheriff's offices, and the Wyoming Highway Patrol). It is intended that this data be used to recognize the circumstances surrounding the truck-involved accident.

Wyoming State Highway Department HS-032 685, May 1981, 38p, 3 Fig., 18 Tab., Phots.

Acknowledgment: National Highway Traffic Safety Administration
Order From: Wyoming State Highway Department, Highway Safety Branch, P.O. Box 1708, Cheyenne, Wyoming, 82001

361933
WISCONSIN ACCIDENT FACTS 1980

This report contains 26 tables: (1) 1980 Facts and Figures; (2) Economic Loss; (3) Reporting Agency; (4) 10 Year Summaries; (5) Accidents by Highway Class-Rural; (6) Accidents by Month; (7) Fatal Accidents By Month; (8) Types of Motor Vehicle Accidents; (9) Blood Alcohol Content of Driver Fatalities; (10) Accidents By Highway System and County; (11) Accidents by County and Severity; (12) Holiday Fatal Accidents and Fatal Accidents By Month; (13) Environmental Conditions; (14) Types of Motor Vehicles; (15) Time of Occurrence; (16) Age of Drivers; (17) All Drinking Drivers and Pedestrians; (18) Drinking Drivers and Pedestrians (Ability Impaired); (19) Possible Contributing Circumstances; (20) Motorcycle Accidents; (21) Motorcycle Graph; (22) Persons Killed and Injured by Age and Type of Accident; (23) Persons Killed and Injured; (24) Persons Killed and Injured by Age-Type of Person and Sex; (25) Economic Loss by Severity-Urban by Population; and (26) Graph on Speed Citations and Possible Contributing Circumstances of Speed.

Wisconsin Department of Transportation HS-032 683, 1981, 32p

Acknowledgment: National Highway Traffic Safety Administration
Order From: Wisconsin Department of Transportation, Traffic Accident Data Section, Madison, Wisconsin, 53702

361934
STANDARDIZATION OF MOTOR VEHICLE EXHAUST SYSTEMS INCLUDING MAXIMUM NOISE LEVELS

To establish national, uniform performance and equipment requirements for exhaust systems on vehicles, as herein defined, and to furnish state administrators with a guide for the uniform regulation of exhaust systems on those vehicles. The scope of this regulation is applicable to passenger cars, multi-purpose passenger vehicles, motorcycles, trucks and buses of gross vehicle weight rating of 10,000 pounds or less for use on the public highways. The regulation sets forth maximum noise levels and discharge point(s) and prohibits certain alterations to exhaust systems.

Vehicle Equipment Safety Commission VESC-21, HS-032 689, Aug. 1981, 5p, Refs.

Acknowledgment: National Highway Traffic Safety Administration
Order From: Vehicle Equipment Safety Commission, 4660 Kenmore Avenue, Suite 802, Alexandria, Virginia, 22304

361935
MINIMUM PERFORMANCE STANDARD FOR AUXILIARY LIQUID FUEL TANKS

The two purposes of this regulation are: (A) To enhance safety by requiring a minimum level of strength and structural integrity in the manufacture and installation of auxiliary liquid fuel tanks; and (B) To provide a uniform, minimum performance standard for auxiliary liquid fuel tanks to state motor vehicle administrators in the regulation of those tanks. This regulation shall be applicable to auxiliary liquid fuel tanks for passenger cars, multi-purpose passenger vehicles, trucks and buses of gross vehicle weight rating of 10,000 pounds or less and shall apply to their manufacture, installation, sale and use. This regulation applies to auxiliary liquid fuel tanks except those which have been certified to FMVSS 301 (Fuel System Integrity-Passenger Cars, Multi-Purpose Passenger Vehicles, Trucks and Buses) or FMCSR 393.65 (All Fuel Systems) and FMCSR 393.67 (Liquid Fuel Tanks), as applicable.

Vehicle Equipment Safety Commission VESC-22, HS-032 690, Aug. 1981, 5p, Refs.

Acknowledgment: National Highway Traffic Safety Administration
Order From: Vehicle Equipment Safety Commission, 4660 Kenmore Avenue, Suite 802, Alexandria, Virginia, 22304

361936

PREDICTING ACCIDENT INVOLVEMENT WITH THE MOTORCYCLE OPERATOR SKILL TEST

The present study was conducted to assess the predictive validity of the Motorcycle Operator Skill Test (MOST) developed by McPherson and McKnight (1976). It was anticipated that among licensed motorcyclists those scoring higher on this off-road skill test would be less likely to become involved in an accident than motorcyclists scoring lower. A sample of motorcycle operator licence applicants was administered the MOST in addition to the regular licensing test. These motorcyclists were contacted about a year later and queried about their riding experiences including motorcycle accidents. Driver records were also searched for six months after the motorcyclist was licensed. Although bivariate analyses indicated that high scorers on the MOST were more likely to have had an accident than low scorers, multivariate analyses revealed no effect of test performance on subsequent accident involvement. However, accident likelihood was found to decrease as a function of age and increase as a function of vehicle distance travelled (i.e. exposure to risk).

Jonah, BA Dawson, NE (Transport Canada Research and Development Centre) Bragg, BWE (Abt Associates of Canada) *Accident Analysis and Prevention* Vol. 13 No. 4, HS-032 718, Dec. 1981, pp 307-318, 5 Tab., Refs.

Acknowledgment: National Highway Traffic Safety Administration
Order From: Pergamon Press Limited, Headington Hill Hall, Oxford OX3 0BW, England

361937

COMMENTARY ON STATISTICAL ISSUES UNDERLYING THE EVALUATION OF A SOCIAL POLICY CHANGE ON MOTOR VEHICLE ACCIDENT INVOLVEMENT

This commentary addresses the statistical issues which are involved in assessing whether a causal interpretation can be given to an association between a change in social policy such as lowering the legal age for drinking alcohol and a change in the nature of accident involvement frequency for a particular sub-population of drivers like 18-20 year olds. In this regard, two methodological concerns are emphasized. The first is the resolution of a possible paradox in the nature of an association in the sense that individuals with greater tendency to accident involvement may also have a greater tendency to alcohol usage so that their alcohol related accident involvement is coincidental rather than causal. For this setting, alcohol would be an "after the fact" correlate with accident involvement as opposed to a possible cause. Similarly, the second concern is the role of population exposure as an explanation for the change in alcohol related accident frequency for a particular age group. Since availability naturally increases the size of the population at risk for such accidents, the corresponding accident frequency may similarly increase even though the corresponding accident rates may have remained unchanged or perhaps even decreased. For these reasons, although associations with change in social policy are definitely of general interest, their interpretation in a causal sense should be viewed with substantial caution until the implications of competing explanations are reconciled. This assertion, however, does not mean that such associations are not useful for policy purposes, but rather that they lack sufficiently targeted statistical validity to be the primary basis for such change. In other words, if there is a strong rationale on economic, political, or social grounds for a policy change, then data presenting meaningful associations which are compatible with it can often play an important supportive role for it.

Koch, GG (North Carolina University) *Accident Analysis and Prevention* Vol. 13 No. 4, HS-032 698, Dec. 1981, pp 323-329

Acknowledgment: National Highway Traffic Safety Administration
Order From: Pergamon Press Limited, Headington Hill Hall, Oxford OX3 0BW, England

361938

THE EPIDEMIOLOGY OF FATAL MOTOR VEHICLE ACCIDENTS IN KUWAIT

The main objectives of this study are to present data on fatal motor vehicle accidents in Kuwait with a view to find out the principal epidemiological features, establish a baseline for future evaluation, use international death rates to compare Kuwait with other countries and offer specific recommendations as to how the risks involved can be reduced. The epidemiology of all fatal accidents which had occurred in Kuwait between 1 January 1977 and 31 December 1978 are analysed. This two-year series, which includes 726 accidents and represents 1.7% of all types of accidents, resulted in 803 deaths (7.3% of the national deaths toll) and 1175 injuries. The death rates per hundred million vehicle kilometers of travel, per 100,000 registered motor vehicles and per 100,000 resident population in 1978 were about 8.5, 84.8 and 31.7 respectively. These figures reveal significantly higher rates than in some industrialized countries, thus ranking motor vehicle accidents among the four leading causes of death and probably as the commonest single cause of death in Kuwait. The study shows that children under the age of 15 yr contributed 26.2% of all motor vehicle fatalities, 40.9% of pedestrian deaths (55.2% of the series), 25% of pedal-cyclist deaths, 6.3% of motorcyclist deaths and 1.2% of driver deaths. It also confirms the importance of the motor vehicle-pedestrian type of accident (58.3%) and the over-representation of buses, trucks and motorcycles with respect to involvement in fatal accidents as compared to their relative ratios of registered vehicles. The principal recommendations call for the formation of a National Council for Road Safety, the establishment of intensive roadside care, traffic education of road users and at risk groups, improvement of the environment and the firm enforcement of the law to curb the toll of this killer disease in a traditional country undergoing rapid modernization like Kuwait.

Bayoumi, A (Kuwait University) *Accident Analysis and Prevention* Vol. 13 No. 4, HS-032 705, Dec. 1981, pp 339-348, 6 Fig., 8 Tab., Refs.

Acknowledgment: National Highway Traffic Safety Administration
Order From: Pergamon Press Limited, Headington Hill Hall, Oxford OX3 0BW, England

361939

ROAD CRASHES AND INJURIES IN QUEBEC (1974): PATTERNS AMONG MANY VARIABLES

Data on 1008 Quebec road victims obtained from linkage of governmental records have led to different types of analyses. This article presents an application of correspondence analysis to these data. We have chosen one example with its specific results showing expected associations between variables and new, unexpected associations which are plausible. The resulting patterns indicate a clear distinction between hospitalized and non-hospitalized victims and between a rural and an urban type of road crash. This multidimensional approach gives an overall picture of the patterns among the variables studied, indicating which subsets of variables might be investigated further.

Bourbeau, RR Laberge-Nadeau, C Latour, R Maag, U (Montreal University, Canada) *Accident Analysis and Prevention* Vol. 13 No. 4, HS-032 720, Dec. 1981, pp 349-355, 1 Fig., Refs.

This article derives from a project done at University of Montreal funded by Health and Welfare Canada (605-1355-44), Quebec Health Insurance, Transport Canada and CAFIR, University of Montreal.

Acknowledgment: National Highway Traffic Safety Administration
Order From: Pergamon Press Limited, Headington Hill Hall, Oxford OX3 0BW, England

361940

COMPUTER PROGRAM SIGSET FOR CALCULATING DELAY-MINIMISING TRAFFIC SIGNAL TIMINGS DESCRIPTION AND MANUAL FOR USERS

Starting from conventional data describing a signal-controlled road junction and the pattern of traffic passing through it, the computer program SIGSET checks whether the specified traffic is within the practical capacity of the junction and, if so, calculates signal timings which minimise the estimated average delay per unit time for the specified traffic, subject to the usual constraints on the durations of the cycle and of particular green periods. The calculated timings provide a basis for setting the maximum green periods of vehicle-actuated signals, or the green periods of fixed-time signals. SIGSET accepts the data and provides output in terms which are largely familiar to practising traffic engineers. It is thus intended for everyday use by them without recourse to specialists in computing or in the theory underlying the calculations. The program has been quite extensively used for a number of years, and this manual draws together earlier documentation and augments it in the light of experience, especially in relation to the scope and applicability of the program and the treatment of opposed turning traffic.

The facilities provided by the program are described and illustrated by examples and detailed instructions for data preparation are given. Current developments based on SIGSET and its companion program SIGCAP are mentioned.

Allsop, RE
University College, London Res Rpt. HS-032 699, Sept. 1981, 32p, 3 Fig., 2 Tab., Refs., 2 App.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: University College, London, Transport Studies Group, Gower Street, London WC1E 6BT, England

361941

REGULATORY ANALYSIS FOR THE NOISE EMISSION REGULATIONS FOR MOTORCYCLES AND MOTORCYCLE EXHAUST SYSTEMS

This document presents the technical data and analyses used by EPA in developing the noise emission regulations for motorcycles and motorcycle exhaust systems. The information presented includes a detailed discussion of: the motorcycle and motorcycle exhaust systems industry; baseline noise levels for current motorcycles; the noise control technology available; the adverse health and welfare impacts of motorcycle noise and the potential benefits of regulation; the expected costs and potential economic effects of regulation; and the noise measurement methodology.

Environmental Protection Agency, (EPA/200/02) Final Rpt. EPA 550/9-80-217, HS-032 707, Dec. 1980, v.p., Figs., Tabs., 15 App.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: Environmental Protection Agency, Office of Noise Abatement and Control, 1921 Jeff Davis Hwy, Arlington, Virginia, 20460

361942

ACCIDENTS AT BLACKSPOTS: ESTIMATING THE EFFECTIVENESS OF REMEDIAL TREATMENT, WITH SPECIAL REFERENCE TO THE "REGRESSION-TO-MEAN" EFFECT

This paper proposes to show that the Bayesian approach is particularly well-suited to analyzing accident blackspot data, and providing information on which to judge the effectiveness of remedial treatment. This method has two main advantages: (1) it focuses the user's attention on the subjective nature of certain aspects of the problem (other methods tend to ignore this), and (2) it automatically takes account of the "regression-to-mean" effect. It also answers a practical question for the traffic engineer, of whether the regression-to-mean effect is likely to be sufficiently large to be worth worrying about for sites in his area, by illustrating the problem with some typical calculations for sites in two local authority areas in the South of England.

Abbess, C Jarrett, D Wright, CC (Middlesex Polytechnic, England)
Traffic Engineering and Control Vol. 22 No. 10, HS-032 693, Oct. 1981, pp 535-542, 5 Fig., 4 Tab., 14 Ref.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: Printerhall Limited, 29 Newman Street, London, England

361943

CHP AND FBI CRACK $1.2 MILLION LUXURY CAR THEFT RING

What is described as the biggest auto-theft ring roundup in Southern California in sixteen years, was made recently by the Southern Division of the California Highway Patrol working with the Federal Bureau of Investigation. The ring specialized exclusively in luxury cars, the cars identification numbers being changed to match the counterfeit ownership titles for sale to buyers, usually in a locality some distance from where they were stolen. Law enforcement officers from 5 others states became involved in addition to CHP and the FBI, as cars stolen in those states were being brought in for sale in California, while cars stolen in California were often being transported out of state for sale. In addition to the story of that roundup, the article examines the stripping of cars for parts, juvenile joy riders, Auto-Statis, a computerized communication set-up (Automatic Statewide Auto Theft Injury System) which helps CHP in catching thieves driving stolen cars. Advice is also given on how to help thwart amateur car thieves, truck stealing and hijacking.

Roper, WL *California Highway Patrolman* Vol. 45 No. 8, HS-032 697, Oct. 1981, p 6

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: California Association of Highway Patrolmen, P.O. Bo 2631, Sacramento, California, 95812

361944

HIGHWAY SAFETY: ROADWAY IMPROVEMENTS, ACCIDENT RATES, AND BICYCLE PROGRAMS

This record contains 26 papers: Highway Safety: An Agenda For Action; H.E. Strate; Interstate Safety Improvement Program; J.G. Pigman, K.R. Agent, C.V. Zegeer; Review Of FHWA's Evaluation Of Highway Safety Projects; G.A. Fleischer; Optimal Allocation Of Funds For Highway Safety Improvement Projects; K.C. Sinha, T. Kaji, C.C. Liu; Driver Compliance With Stop-Sign Control At Low-Volume Intersections; J.M. Mounce; Driver Response To A Highway Advisory Radio System In New Braunfels, Texas (Abridgment); J.C. Dabney, C.L. Dudek; Motorists' Needs For Information On Services; G.F. King; Comparison Of Truck And Passenger-Car Accident Rates On Limited-Access Facilities; W.S. Myers; Relationship Of Accident Frequency To Travel Exposure; W. Borg, B. Kuffner; Bicycle As A Collector Mode For Commuter Rail Trips; W. Feldman; Public Policy And Decision-Analysis Methods: Development Of The National Comprehensive Bicycle Program; C.W. Ryan, R.S. Schermerhorn; Bicycle Task Analysis: Development And Implications; M. Wirth, E. Cone, K. Moran; and Engine Tune-Ups And Passenger Car Fuel Consumption (Abridgment); P.J. Claffey.

Transportation Research Record No. 808, HS-032 706, 1981, 86p, Figs., Tabs., Refs.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: TRB Publications Off

361945

MOTORCRAFT MAKEOVER

Often alternators are condemned as being bad when all that is really wrong with them is something simple like shorted diodes or worn brushes. This article offers a routine checking procedure for the mechanic, which will prevent him from overlooking simple problems in a rush to discover serious ones. This checklist consists of: Battery tests, output tests, bench tests, field circuit test, rotor tests, stator test, diode testing, and reassembly. The article is illustrated.

Cerullo, B *Motor* Vol. 156 No. 5, HS-032 712, Nov. 1981, p 33, Phots.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: Hearst Books, Motor Books Department, 224 West 57th Street, New York, New York, 10019

361989

CRASH PROTECTION SYSTEMS FOR HANDICAPPED SCHOOL BUS OCCUPANTS VOLUME II-TECHNICAL REPORT. FINAL REPORT

A series of sled tests were conducted to determine the influence of five major parameters on the occupant protection of handicapped school bus passengers. The selected parameters were bus crash pulse, dummy size, wheelchair orientation, wheelchair securement type and passenger protection system. In the tests, both ambulatory and wheelchair seated occupants were simulated with anthropomorphic dummies, and padding and belt systems were evaluated in both large and small school buses. The parameters were established via baseline bus crash tests, a state of the art survey, and an accident data analysis-all described in the Interim Report to this contract. The present report describes the results, and analyses of the results, which show the influence of each parameter on occupant protection. The results provide a data base that could be effectively used in designing complete passenger protection systems for handicapped passengers in school buses.

Khadilkar, AV Will, E Costa, V
Minicars, Incorporated, National Highway Traffic Safety Administration
Final Rpt. FR-1074-03-81, HS-805 827, Mar. 1981, 113p, Figs., Tabs., 11 Ref.
Contract

DOT-HS-7-01774

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: NTIS

361990

CRASH PROTECTION SYSTEMS FOR HANDICAPPED SCHOOL AND TRANSIT BUS OCCUPANTS VOLUME V-APPENDICES F AND G

A series of eight school and transit buses were subjected to nine frontal fixed barrier, two rear moving barrier and three side impact tests. Each test bus carried up to seven fully instrumented dummies--one in the driver seat, two in forward facing seats, two in side facing seats, and two in wheelchairs. The wheelchairs were secured and the wheelchair-seated dummies were restrained using commercially available restraint systems. The dummy locations, wheelchair securements, passenger restraints, crash modes and impact speeds were selected on the basis of a state-of-the-art survey and accident data analysis of operational practices and experiences with school and transit buses. The report contains the results of the state-of-the-art survey, accident data analysis and the bus crash test program. Typical deceleration crash pulses for a wide range of school bus sizes and full size transit buses are presented, as are plots of dummy trajectories and records of dummy injury measures for the selected test conditions. The report is presented in five volumes: Volume I, Executive Summary; Volume II, Technical Report; Volume III, Appendices A, B, C and D; Volume IV, Appendix E; and Volume V, Appendices F and G.

Khadilkar, AV Will, E
Minicars, Incorporated, National Highway Traffic Safety Administration Intrm Rpt. IR-1074-12-80, HS-805 825, Dec. 1980, 856p, 6 Fig., 6 Tab. Contract

DOT-HS-7-01774

Acknowledgment: National Highway Traffic Safety Administration
Order From: NTIS

361991

TRAFFIC SAFETY TRENDS AND FORECASTS

The primary objectives of this document are to describe some of the past traffic safety trends and to forecast potential problem areas as they might emerge in the 1980 decade. It is designed to provide NHTSA program planners and managers with a uniform set of projections of future events, conditions and circumstances which could affect the future traffic safety environment. Hopefully, this document will be the first step in establishing a standardized forecasting data base with general applicability and with Agency-wide agreement on assumptions, analyses and projections.

National Highway Traffic Safety Administration HS-805 998, Oct. 1981, 40p, Tabs., 3 App.

Acknowledgment: National Highway Traffic Safety Administration
Order From: National Highway Traffic Safety Administration, 400 7th Street, SW, Washington, D.C., 20590

361992

EMERGENCY MEDICAL SERVICES

Quality emergency medical care is an essential public health service. The ability to provide prompt, effective emergency medical care to accident victims at the scene increases their chances of survival. State and local governments depending on their geographic and demographic features, provide emergency medical services (EMS) in a variety of ways. Since 1966 the Federal Government (U.S. Department of Transportation) has provided financial and technical assistance through the "402" grant process to States for improving EMS programs. However, recent cuts in Federal funding (including EMS) and the imposing of new eligibility guidelines has raised concern within the EMS community about it's ability to provide quality emergency medical care. This report focuses on five significant issues which impact the quality and availability of EMS. (1) Department of Transportation/Department of Health and Human Services Memorandum of Understanding; (2) "402" Funding of EMS Programs; (3) Terminology and Training Levels; (4) Evaluation Techniques; and (5) Hazardous Material Accident Response Guidelines.

National Highway Traffic Safety Administration HS-805 999, Oct. 1981, 63p

A Report to the Secretary of Transportation by the National Highway Safety Advisory Committee.

Acknowledgment: National Highway Traffic Safety Administration
Order From: National Highway Traffic Safety Administration, 400 7th Street, SW, Washington, D.C., 20590

361993

FACTORS INFLUENCING THE RISK OF INJURY IN PASSENGER CAR AND OTHER VEHICLE COLLISIONS WITH TRUCK REAR END

NHTSA has performed a study of the occupant safety problem in cars and other vehicles which strike the rear ends of heavy trucks, and the results are reported in "Rulemaking Support Paper for Truck Rear End Guard Protection". That paper has identified the principal factors which influence the risk of occupant injury and has presented the values and corresponding probability distributions for each factor which characterizes the current and future universe of accident conditions. However, in the interest of brevity in that paper, references have been made to other documents for details. Therefore, this document has been written to provide more detailed consideration of the factors influencing occupant injury in vehicles impacting the rear of heavy trucks and to derive the representative values for such factors as well as their probabilities of occurrence.

Cooke, C
National Highway Traffic Safety Administration HS-806 067, June 1980, 26p, Figs., Tabs., 6 Ref.

Acknowledgment: National Highway Traffic Safety Administration
Order From: National Highway Traffic Safety Administration, 400 7th Street, SW, Washington, D.C., 20590

361994

DESCRIPTIVE PARAMETERS USED IN ANALYZING THE BRAKING AND HANDLING OF HEAVY TRUCKS. STEERING AND SUSPENSION SYSTEMS--VOLUME 4

This Volume is one of a set of five volumes being prepared under support from the Motor Vehicle Manufacturers Association. The set of volumes is entitled "Descriptive Parameters Used in Analyzing the Braking and Handling of Heavy Trucks." The volumes address the acquisition of data on (1) brakes, (2) inertial properties, (3) tires, (4) steering and suspension systems, and (5) antilock systems.

Winkler, CB Fancher, PS
Highway Safety Research Institute, Motor Vehicle Manufacturers Assn of the U.S., Inc, (361912) Final Rpt. UM-HSRI-81-19-4, HS-032 723, Oct. 1981, v.p., Figs.
Contract

MVMA Proj 1196

Acknowledgment: National Highway Traffic Safety Administration
Order From: Highway Safety Research Institute, Huron Parkway and Baxter Road, Ann Arbor, Michigan, 48109

361995

WINDSHIELD DAMAGE AND DRIVING SAFETY

Three tasks concerned with windshield damage and driving safety were completed. First, a review of the literature revealed abundant information on general problems of visibility and the assessment of windscreen optical quality, but little information specifically pertaining to windshield damage. Second, the available accident data were analyzed. While the evidence is tenuous and sparse, there were no indications that windshield damage has been a causal factor in accidents. Only in the CPIR computerized accident file has windshield condition been coded, and in that file only two vehicles had pre-crash windshield damage. In neither case was it a causal factor. Finally, in a two-choice response time experiment, sixteen drivers viewed slides of nighttime road scenes through four different windshields. Drivers were asked to indicate if it was "safe to proceed" (or not) by pressing buttons. Increasing the degree of windshield damage led to increases in response time, especially when a light simulating the glare of an oncoming vehicle's headlamps was present. This last result suggests to the authors that windshield damage is a visibility problem that should receive more attention from drivers and safety organizations.

Green, P Burgess, WT
Highway Safety Research Institute, Auto Glass Industry Committee for Highway Safety Final Rpt. UM-HSRI-81-35, HS-032 731, June 1981, 73p, 6 Fig., 7 Tab., Refs., 5 App.
Contract

80-1352-C1

Acknowledgment: National Highway Traffic Safety Administration
Order From: NTIS

361996

PEDESTRIAN ACCIDENT REDUCTION GUIDE. GUIDELINES FOR A SUCCESSFUL PROGRAM. WHY THE APPROACH WORKS, ACCIDENT TYPES, COUNTERMEASURES

This Pedestrian Accident Reduction (PAR) Guide provides guidelines for a successful pedestrian safety program at the local, regional, and state levels. It also provides information about accident types and the countermeasures now available.

National Highway Traffic Safety Administration   HS-805 850, Nov. 1981, 40p

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: National Highway Traffic Safety Administration, Office of Driver and Pedestrian Programs, Washington, D.C., 20590

361997

FINAL REGULATORY IMPACT ANALYSIS. AMENDMENT TO FMVSS 208 OCCUPANT CRASH PROTECTION. RESCISSION OF AUTOMATIC OCCUPANT PROTECTION REQUIREMENTS

This report presents the National Highway Traffic Safety Administration (NHTSA) assessment of the benefits and costs of a revision of Federal Motor Vehicle Safety Standard (FMVSS) No. 208, Occupant Crash Protection. It addresses three possible amendments, examining each to determine the net effect on consumers, industry and the national economy. NHTSA's conclusion is that the automatic occupant protection requirements of FMVSS No. 208 should be rescinded. This conclusion is based on the following findings: (1) the standard is not practicable due to the high costs and the uncertainty of the magnitude, if any, of safety benefits associated with the standard; and (2) the standard would not lead to improved auto safety because of the potential adverve safety consequences that the standard would likely generate.

National Highway Traffic Safety Administration   HS-806 055, Oct. 1981, v.p., Figs., Tabs., 3 App.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: National Highway Traffic Safety Administration, Office of Program and Rulemaking Analysis, Washington, D.C., 20590

361998

A STUDY OF ALCOHOL INVOLVEMENT IN YOUNG DRIVER ACCIDENTS WITH THE LOWERING OF THE LEGAL AGE OF DRINKING IN ALABAMA

Accident experience in Alabama is reviewed in light of the reduction in the legal drinking age in 1975 from 21 to 19 years. Available data required an analysis of alcohol related accidents in the 18 to 20 year old group, which provided a conservative estimate of the overall change associated with the legislative action. Several statistical tests were performed to compare the 18-20 year old group with other groups throughout the period from 1972 through 1979. These confirm that (1) alcohol related single vehicle accidents within this age group were significantly lower than those of other age groups prior to the legal age reduction, and (2) currently, after the legal age reduction, there is no significant difference between the age groups. An analytical comparison of these results with other recent research findings is given.

Brown, DB   Maghsoodloo, S (Auburn University)   *Accident Analysis and Prevention*   Vol. 13 No. 4, HS-032 724, Dec. 1981, pp 319-322, 2 Tab., Refs.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: Pergamon Press Limited, Headington Hill Hall, Oxford OX3 0BW, England

361999

THE SMALL CAR WITH A VIEW TOWARD A SAFETY INDEX

This paper takes a broad look at the conditions contributing to the growth of the small car population and what effect it might have on the accident rate. It then looks at some of the attributes of the small car that could influence the accident rate and injury severity. There is also discussion on plans for a course of research that would be required to rate small cars and develop a safety index.

Schorr, DJ   *ITE Journal*   Vol. 51 No. 11, HS-032 721, Nov. 1981, pp 14-19, 3 Fig., 20 Ref.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: Institute of Transportation Engineers, 525 School Street, SW, Suite 410, Washington, D.C., 20024

362000

TRAFFIC SAFETY–AN INTERNATIONAL CONCERN

This article addresses the problem of attaining agreement on international regulations for safety in traffic. It states that the recommendations made by international organizations usually go no further than what the country with the least demands can accept. It points to the need in Europe for agreement with regard to speed limits, obligatory use of seat belts, obligatory use of helmets, regulations dealing with the use of alcohol and drugs in traffic, driver training, and medical prerequisites for a driver's license. In conclusion it is stated that harmony as regards traffic regulations in Europe is not to be expected within the foreseeable future unless extraordinary measures are taken.

Journal of Traffic Medicine   Vol. 9 No. 3, HS-032 726, Sept. 1981, pp 36-37

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: International Assn of Accident & Traffic Medicine, P.O. Box 10043, S-10055 Stockholm 10, Sweden

362001

WHO EXPERTS WARN OF DANGER IN MIXING PSYCHOTROPICS WITH DRIVING

Pointing out that few studies have been made of the role that pyschotropic drugs play in traffic accidents, this brief article discusses the role of the World Health Organization in evaluating the safety and efficacy of drugs and in recommending controls when a threat to public health has been shown. Reference is made to a recent measure adopted in Norway to increase public awareness of drugs that are a hazard in combination with driving. Pharmacists are required to place red triangle labels on designated drugs to warn that medication so marked should not be taken when driving.

Ozorio, P   *Journal of Traffic Medicine*   Vol. 9 No. 3, HS-032 730, Sept. 1981, pp 38-39

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: International Assn of Accident & Traffic Medicine, P.O. Box 10043, S-10055 Stockholm 10, Sweden

362002

227 MILLION AMERICAN HOSTAGES

Stating that Americans are being held hostage in automobiles, this article goes on to point out the various statistics on fatalities and injuries, concluding that we are facing a "disease" which can be medically diagnosed as "mobilopathy". Pointing out that historically diseases were eliminated by identifying the cause, vector, and disease, and providing treatment and prevention, it is stated that these things have now been scientifically established in the case of automobile accidents and that the "vaccine" now available for the prevention of death due to transportation is the implementation of better public transportation and safer, cleaner, efficient personal transportation vehicles, along with making streets and roads accident-proof.

Grossman, AM   *Journal of Traffic Medicine*   Vol. 9 No. 3, HS-032 725, Sept. 1981, pp 41-42, 28 Ref.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: International Assn of Accident & Traffic Medicine, P.O. Box 10043, S-10055 Stockholm 10, Sweden

362003

EPIDEMIOLOGY OF ACCIDENTS

The author presents a methodology for studying traffic accidents as a form of epidemic. He gives a lengthy history of epidemiology beginning with Hippocrates, and then procedes with methodology for research of traffic accidents based on epidemiological research. Criteria are given for personnel training and data acquisition, classification and analysis. The author then discusses the application of epidemiological concepts such as etiology, infectiousness, virulence, pathogenic capacity, resistance, immunity, and carriers to the field of accident research.

Huttich, RC   *Journal of Traffic Medicine*   Vol. 9 No. 3, HS-032 734, Sept. 1981, pp 44-49

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: International Assn of Accident & Traffic Medicine, P.O. Box 10043, S-10055 Stockholm 10, Sweden

362004

NATIONAL ACCIDENT SAMPLING SYSTEM DATA COLLECTION, CODING AND EDITING MANUAL. 1982 CONTINUOUS SAMPLING SYSTEM VERSION 5

When completely developed, part of the National Accident Sampling System will consist of 75 small teams of accident investigators situated throughout the 48 contiguous states and Hawaii. At each site (Primary Sampling Unit--PSU), the accident research team will investigate a probability sample of police reported accidents on a continuous basis. Zone Centers will provide quality control. The purpose of this manual is to provide PSU team members, Zone Centers, the data processing contractor, sampling contractor, training contractors, and the National Center for Statistics and Analysis with a consistent, standardized set of instructions for sampling accidents and collecting, coding and editing the data.

National Highway Traffic Safety Administration HS-806 066, Dec. 1981, v.p., Figs., Tabs.

Acknowledgment: National Highway Traffic Safety Administration
Order From: National Highway Traffic Safety Administration, 400 7th Street, SW, Washington, D.C., 20590

362005

SAFETY RELATED RECALL CAMPAIGNS FOR MOTOR VEHICLES AND MOTOR VEHICLE EQUIPMENT, INCLUDING TIRES JULY 1, 1981-SEPTEMBER 30, 1981

This document contains defect recall campaign analysis by manufacturers, both domestic and foreign, for motor vehicles, motor vehicle equipment and tires.

National Highway Traffic Safety Administration HS-806 054, 1981, 11p
Report to the National Highway Traffic Safety Administration by Domestic and Foreign Vehicle Manufacturers.

Acknowledgment: National Highway Traffic Safety Administration
Order From: GPO

362006

FATAL ACCIDENT REPORTING SYSTEM 1980. AN OVERVIEW OF U.S. TRAFFIC FATAL ACCIDENT AND FATALITY DATA COLLECTED IN FARS FOR THE YEAR 1980

This publication focuses on the fatal accidents and fatalities reported in the Fatal Accident Reporting System (FARS) data file for 1980. A wide spectrum of data, in many different combinations is presented under the headings: Figures and Tables, highlights, fatality profile, state statistics, accidents, vehicles, drivers, occupants, nonoccupants, Puerto Rico, selected comparisons for 1975-1980, fatality scenarios, glossary, 1980 coding forms, 1980 involvement and fatalities by body type, and index.

National Highway Traffic Safety Administration HS-805 953, Oct. 1981, 96p, 61 Fig., 43 Tab., 2 App.

Acknowledgment: National Highway Traffic Safety Administration
Order From: National Highway Traffic Safety Administration, National Center for Statistics and Analysis, Washington, D.C., 20590

362007

STRUCTURAL MECHANICS OF RADIAL TIRES

The principal object of this paper is to review and summarize (but not all inclusively) the structural properties of radial tires, along with elastic belt properties that have been reported since 1967. The paper is divided into five main sections: (1) Introduction; (2) Cross-sectional shape of inflated radial tire; (3) Elastic properties of a tire belt; (4) Structural properties of radial tires; and (5) Conclusions.

Akasaka, T (Chuo University, Japan) *Rubber Chemistry and Technology* Vol. 54 No. 3, HS-032 743, July 1981, pp 461-492, 38 Fig., 46 Ref.

Acknowledgment: National Highway Traffic Safety Administration
Order From: American Chemical Society, Rubber Division, University of Akron, Akron, Ohio, 44325

362008

ELECTRONICS: THE FUTURE IS NOW

Electronics have been in automobiles for years, but today's widespread use-especially of "black boxes" with lightning-quick electrical relays replacing mechanical and pressure-operated engine-control functions-probably owes its development to Washington-imposed emission standards. Electronics is a correct technology for control and display systems and can improve engine efficiency and performance in a variety of ways. On board electronics provide greater reliability but are subject to misdiagnosis by mechanics in the field. While prospects for electronics in automobiles are bright, the beacon light for major short-term gains shines on heavy duty trucks: an electronically controlled transmission is being road tested and expected to improve mileage by 2 to 3%.

Scanlon, M *Ward's Auto World* Vol. 17 No. 11, HS-032 735, Nov. 1981, p 44

Acknowledgment: National Highway Traffic Safety Administration
Order From: Ward's Communications, Incorporated, 28 West Adams Street, Detroit, Michigan, 48226

362009

WHAT'S THAT NOISE? PART TWO

This article reviews the noises made by clutches, manual transmission, automatic transmissions and axles, and gives suggestions on the causes of these noises. The automatic transmissions made by American Motors, the Chrysler Corporation, Ford Motor Company and General Motors are detailed.

Driver Vol. 15 No. 6, HS-032 729, Nov. 1981, pp 22-26 Part I of this article was published in the October 1981 issue.

Acknowledgment: National Highway Traffic Safety Administration
Order From: GPO

362010

TROUBLE-SHOOTING YOUR CAR'S AIR SYSTEM

There are two kinds of air-injection reaction (AIR) systems: one forces air into the exhaust with a belt-driven pump, the other uses exhaust-manifold vacuum to draw air in. To inspect an AIR system that uses a pump, one must: (a) look at the pump drive belt; (b) check pump output; (c) inspect hoses; (d) check the diverter valve; (e) inspect the check valve; (f) check the air manifold. To inspect an AIR system that does not use a pump, one must follow these procedures: (a) check the condition of the hoses; (b) inspect the check valve. Performing the preceding inspection rituals annually and at every tune-up will likely catch a problem before it develops. If not, some common problems with explanations of what one should do about them are reviewed: backfiring during deceleration, frozen pump, charred air-delivery hoses and surging cr poor performance.

Hill, R *Popular Science* Vol. 219 No. 6, HS-032 727, Dec. 1981, pp 104-106

Acknowledgment: National Highway Traffic Safety Administration
Order From: Times Mirror Magazines, Incorporated, 380 Madison Avenue, New York, New York, 10017

362011

END THE 55-MPH SPEED LIMIT?

This article consists of two interviews, one with Senator Carl Taggart, Wyoming, and the other with Vincent L. Tofany, President of the National Safety Council. Senator Taggart argues that the states should decide whether to enforce or repeal the 55-mph speed limit, that it does not save that much gas anyway, that the federal government should not blackmail the states by withholding federal highway funds that are sorely needed if the states don't comply with that speed limit, and concludes that he is hopeful that the Reagan administration will not penalize Wyoming for raising the speed limit. Mr Tofany on the contrary, says the law should not be repealed, that it does save fuel and as important that it saves many lives (for example Interstates account for 8% of the fatalities nationally but in Wyoming they account for 26%) and he concludes that conserving energy and conserving a national resource people-are clearly in the national interest.

US News and World Report Vol. 90 No. 2, HS-032 746, June 1981, pp 43-44, 2 Phot.

Acknowledgment: National Highway Traffic Safety Administration
Order From: US News and World Report Incorporated, 2300 N Street, NW, Washington, D.C., 20037

362012

1980 AND 1979 FORD F-150 LIGHT TRUCK WEIGHT AND MANUFACTURING COST ANALYSIS

This report covers the results of a weight and cost analysis of selected Ford F-150 light truck components. The objectives were to acquire baseline data on automotive technology being employed to further fuel economy improvements. 171 components were selected for the cost analysis which provided a basis for comparing weight and costs of HSLA, aluminum and fiber glass reinforced plastics as alternate material for those parts where such substitutions would be practical. The study identified and compared component weight savings and cost per pound saved. A weight comparison of the 4-wheel drive component between the 1979 and 1980 models was also performed as well as an analysis of the weight propagational effects due to increases in vehicle GVWR. The weight propagation analysis indicated which components changed in weight with increased GVWR, drive train and suspension, and the relative magnitude. Material substitution analysis resulted in a cost savings ($0.01/lb.) to ($0.44/lb.) for HSLA, and a cost penalty of $0.28 lb. to $4.98/lb. for aluminum and $1.44/lb. to $13.81/lb. for FRP, for each pound of weight saved. 4-wheel drive weight reduction from 1979 to 1980 was 79 lbs. The net penalty for GVWR increase for 1980 F-150 trucks is 290 lbs.

Ludtke, NF (Pioneer Engineering and Manufacturing Company) Taylor, T, Jr

Corporate-Tech Planning Incorporated, Department of Transportation Final Rpt. HS-805 981, Mar. 1981, v.p., Figs., Tabs., 2 App.
Contract

DOT-HS-9-02110

Acknowledgment: National Highway Traffic Safety Administration
Order From: NTIS

362013

THE NEW ESCORT. THE EUROPEAN VERSION OF FORD'S WORLDWIDE PINTO-ESCORT CONCEPT

The new Ford Escort is a front-wheel-driven vehicle with a 3/5-door semi fast back Sedan body style, with Wagon/Van derivatives. Its new aluminium head OHC engines of 1100cc, 1300cc and 1600cc displacement feature hemispherical combustion chambers and hydraulic tappets. To allow for optimum and flexible use of Ford's engine plant capacities the new Escort is also marketed in some European countries with the well known 1100cc Valencia engine of the Fiesta (Aigner and Franz, 1978). The Sedan and Wagon models have independent rear suspensions, and the Van derivative has a beam rear axle with leaf springs on an extended wheel base. The front suspension is based on the reliable McPherson strut concept with offset springs; the 1100cc model has a tie bar, and the 1300cc and 1600cc models have stabilizer antiroll bars to hold and support the front axle. The 4-speed, all synchromesh gear box is of the same design as the Fiesta's, which permits multi model usage and manufacturing rationalisation. An automatic 3-speed transmission option is in development and will be launched soon. Similar to other Ford models the new Escort series range from Base and "L" to "GL" and Ghia with additional "S" pack versions and a Super "S" for sporty driving. Local customer needs and preferences, together with national legal requirements made it necessary to combine and optimise body styles, engines and series for 15 different markets. The summary of technical data and features at the end of this report gives an impression of the many combinations possible.

Aigner, J Gogel, E Cayless, G (Ford Motor Company) *International Journal of Vehicle Design* Vol. 2 No. 4, HS-032 737, Nov. 1981, pp 381-407, 19 Fig., 4 Ref.

Acknowledgment: National Highway Traffic Safety Administration
Order From: Inderscience Enterprises Limited, La Motte Chambers, St Helier, Jersey, England

362014

WHEEL SLIPS AND SLIDES DURING TURNING IN ARTICULATED VEHICLES

The paper presents the results of studies on the turning of stationary articulated vehicles. On the basis of these studies, mathematical models of articulated vehicles are suggested representing the most popular methods of coupling wheels to power transmission systems. Using these models, the author presents an analytical description of wheel slips and slides during the turning of these vehicles with one axle coupled to the power transmission system, a kinematic slip angle only occurs; in the case of a vehicle with two axles coupled by a driving shaft, however, longitudinal slips also occur. These slips have opposite signs for the outer and inner wheels. The results of computations concerning slip angles and longitudinal wheel slips for different design parameters of an articulated vehicle are presented diagramatically.

Dudzinski, P (Technical University of Wroclaw, Poland) *International Journal of Vehicle Design* Vol. 2 No. 4, HS-032 740, Nov. 1981, pp 439-452, 9 Fig., Refs.

Acknowledgment: National Highway Traffic Safety Administration
Order From: Inderscience Enterprises Limited, La Motte Chambers, St Helier, Jersey, England

362015

MISSISSIPPI. ANNUAL SUMMARY 1980

This summary is divided into two sections: General information graphs and Mississippi Highway Safety Patrol Activity graphs. The first section includes data on type, location, number of accidents, vehicle type, driver age, sex, residence, and fatalities (statewide, by county, by month, by time of day and day of the week and type of highway). The second part deals with moving hazardous violations (by district, by month, per man) arrests, tickets written, law enforcement activities, statistical summaries of accidents by district, state and federal, statewide, driver improvement, driver licensing, data processing implied consent and the Safety Responsibility Bureau.

Highway Patrol Department of Public Safety HS-032 742, 1980, v.p.

Acknowledgment: National Highway Traffic Safety Administration
Order From: Highway Patrol Department of Public Safety, 1900 Woodrow Wilson Drive, Highway 51 N, Jackson, Mississippi, 39216

364847

TRANSPORTATION OF HAZARDOUS MATERIALS

This bulletin covers approaches to dealing with incidents involving hazardous materials in transport with the legal and safety issues as a key concern. Planning and training in response to vehicles transporting hazardous materials is addressed. The report also includes summaries of exemplary state local programs, and describes Federal activity on the topic.

Public Technology, Incorporated, Office of the Secretary of Transportation DOT-I-80-46, Sept. 1980, 64p
Sponsored in part by Urban Consortium for Technology Initiatives.
Contract

DOT-OS-80076

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Order From: NTIS

PB82-154071

364878

A COMPUTER PROGRAM (HEVSIM) FOR HEAVY DUTY VEHICLE FUEL ECONOMY AND PERFORMANCE SIMULATION. VOLUME I: DESCRIPTION AND ANALYSIS

This report presents a description of a vehicle simulation program, which can determine the fuel economy and performance of a specified motor vehicle over a defined route as it executes a given driving schedule. Vehicle input accommodated by HEVSIM include accessories, engine, rear axle, converter, transmission, tires, aerodynamic drag coefficient, and shift logic. The report consists of three volumes. Volume I presents a description of the numerical approach and equations, Volume II is a user's manual, and Volume III contains the program listings.

Buck, RE

Transportation Systems Center, National Highway Traffic Safety Administration, Urban Mass Transportation Administration Final Rpt. DOTTSC-NHTSA-81-14-1, HS-805 910, Sept. 1981, 26p, 2 Fig.
See also Volume 2, PB82-164583. Also available in set of 3 reports PC E99, PB82-164567.

Acknowledgment: NTIS
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PB82-164575

364879

A COMPUTER PROGRAM (HEVSIM) FOR HEAVY DUTY VEHICLE FUEL ECONOMY AND PERFORMANCE SIMULATION. VOLUME II: USERS' MANUAL

Volume II is the second volume of a three volume document describing the computer program HEVSIM for use with buses and heavy duty trucks. This volume is a user's manual describing how to prepare data input and execute the program. A strong effort has been made to prepare this manual from a user's viewpoint. Sample cases have been included to illustrate the various simulation methods available, and the most frequently used HEVSIM options.

Buck, RE

Transportation Systems Center, National Highway Traffic Safety Administration, Urban Mass Transportation Administration Final Rpt. DOTTSC-NHTSA-81-14-2, HS-805 911, Sept. 1981, 78p, 14 Fig., 1 Tab.

See also Volume 1, PB82-164575, and Volume 3, PB82-164591. Also available in set of 3 reports PC E99, PB82-164567.

Acknowledgment: NTIS
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PB82-164583

364980

A COMPUTER PROGRAM (HEVSIM) FOR HEAVY DUTY VEHICLE FUEL ECONOMY AND PERFORMANCE SIMULATION. VOLUME III: APPENDICES A THROUGH F

Volume III is the third and last volume of a three volume document describing the computer program HEVSIM. This volume includes appendices which list the HEVSIM program, sample part data, some typical outputs and updated nomenclature.

Buck, RE

Transportation Systems Center, National Highway Traffic Safety Administration, Urban Mass Transportation Administration Final Rpt. DOTTSC-NHTSA-81-14-3, HS-805 912, Sept. 1981, 319p

See also Volume 2, PB82-164583. Portions of this document are not fully legible. ñ Also available in set of 3 reports PC E99, PB82-164567.

Acknowledgment: NTIS
Order From: NTIS

PB82-164591

364988

WORKSHOP TO REVIEW PROBLEM-BEHAVIOR RESEARCH PROGRAMS: PEDESTRIAN, BICYCLE, AND PUPIL TRANSPORTATION SAFETY

This report presents the proceedings of a workshop on pedestrian, bicycle, and pupil transportation safety. The purpose of this workshop was to develop specific recommendations for the planning and implementation of NHTSA research, development, and demonstration projects in the program area of Pedestrian, Bicycle, Pupil Transportation Studies. Workshop participants represented both the practitioner and researcher communities. Specific program elements were reviewed in-depth. Two working groups participated in a series which dealt with the following topics: Research and Development; Traffic Safety Programs; and Technology Transfer. This report summarizes discussions of these topics. Recommendations about specific program elements concerning the direction of future research in this area are presented.

Marks, ME McNair, JW Jones, RK Joscelyn, KB

Highway Safety Research Institute, National Highway Traffic Safety Administration Final Rpt. UM-HSRI-81-22, HS-806 057, Sept. 1981, 131p, Figs., 4 App.

See also PB81-220725.

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DOT-HS-8-02031

Acknowledgment: NTIS
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PB82-183658

364989

IMPROVEMENT OF METHODS FOR DETERMINING PRE-CRASH PARAMETERS FROM SKID MARKS

This report presents the results of an experimental study, the goal of which was to validate and improve the methods currently used by accident reconstructionists to determine precrash parameters from skid marks. The three major issues concentrated on by this study were to validate or improve the currently used skid mark length versus prebraking speed formulas; to determine which method of measuring the coefficient of friction between the tire and the road produces the best results; and to see if unlocked wheels could produce skid marks. Six vehicles, three cars and three trucks, were tested during this study. The vehicles were tested with a variety of tire types and vehicle loadings on three different pavements. Both severe (wheels locked) and moderate (no wheels locked) stops were made from five speeds ranging from 10 to 60 mph. Prebraking speed, stopping distance and the length of the skid marks produced were determined for each stop. Stripchart recordings showing, as functions of time, distance travelled, speed, applied brake pedal force, longitudinal deceleration and the rotational rate of each wheel were also made. Regression analyses were performed to see how well the currently used skid mark length versus prebraking speed formulas and two modified forms of the currently used formulas fit the experimental data. These analyses showed that the currently used formulas provided an excellent fit to the test data. Furthermore, neither of the modified formulas were able to better explain the test data.

Garrot, WR Guenther, D Houk, R Lin, J Martin, M

Safety Research Laboratory, P.O. Box 37, (NRD-52) Final Rpt. SRL-25, HS-806 063, May 1981, 167p, Figs., Tabs., 4 Ref., 1 App.

Prepared in cooperation with Vehicle Research and Test Center, East Liberty, OH.

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PB82-183716

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344609, 344598

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344258

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344623, 361317

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343667, 344512

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361550

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362006

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197699, 349493

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197709

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346021

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION Office of Passenger Vehicle Research, 400 7th Street, SW; Washington, D.C., 20590
344506, 343681, 343716, 343713, 361554

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION Office of Program and Demonstration Evaluation; Washington, D.C., 20590
349492

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION Office of Program and Rulemaking Analysis; Washington, D.C., 20590
361997

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION Office of Research and Development, 400 7th Street, SW; Washington, D.C., 20590
329043, 343739, 337224, 346713, 346161

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION Office of Standards Development and Implementation; Washington, D.C., 20590
361570, 361569

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION Office of State Program Assistance; Washington, D.C., 20590
349495

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361568

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344504

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361558

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION Technical Services Division, 400 7th Street, SW; Washington, D.C., 20590
326369

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION Traffic Safety Programs, 400 7th Street, SW; Washington, D.C., 20590
346111

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION 400 7th Street, SW; Washington, D.C., 20590
318905, 318413, 314063, 318911, 318981, 132132, 344501, 344422, 344447, 343714, 344623, 344505, 337893, 344416, 344526, 344439, 337892, 344445, 344446, 343728, 344440, 342083, 344437, 344443, 344438, 346125, 346756, 346175, 346068, 34[illegible]145, 346181, 346700, 346018, 346755, 346019, 346162, 346680, 346109, 346142, 346121, 346163, 346033, 346165, 346016, 346170, 346146, 346191, 346134, 346143, 346122, 346199, 346118, 346196, 346124, 346189, 346190, 346123, 346686, 346144, 346661, 346698, 346164, 346187, 346067, 347732, 346670, 346188, 346699, 346117, 347733, 347899, 349193, 349191, 349497, 349490, 349190, 349491, 349194, 349494, 349496, 361555, 361559, 361567, 361566, 361557, 361551, 362004, 361991, 361990, 361992, 361993, 361996, 362005, 361989, 364880, 364988, 364879, 364878

NATIONAL INSTITUTE FOR TRANSPORT & RD RES, S AF P.O. Box 395; Pretoria, Transvaal, South Africa
348915, 348918

NATIONAL INSTITUTE OF LAW ENFORCE & CRIMINAL JUST 4340 East-West Highway; Bethesda, Maryland, 20014
344258

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346109

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361773

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349829, 361384

NATIONAL SAFETY COUNCIL 444 North Michigan Avenue; Chicago, Illinois, 60611
349492

NATIONAL SWEDISH ROAD & TRAFFIC RESEARCH INSTITUTE Fack; S-581 01 Linkoeping, Sweden
331215, 361383, 361318

NATIONAL TRANSPORTATION SAFETY BOARD Bureau of Accident investigation; Washington, D.C., 20594
349821, 349822, 349815, 361363, 361364, 361592

NATIONAL TRANSPORTATION SAFETY BOARD Bureau of Technology; Washington, D.C., 20594
361760, 361591

NATIONAL TRANSPORTATION SAFETY BOARD Office of Evaluation and Safety Objectives; Washington, D.C., 20594
335421, 361608

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344111

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331278, 342376

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361544, 361545, 361548, 361546, 361547

NEVADA DEPARTMENT OF TRANSPORTATION 1263 South Stewart Street; Carson City, Nevada, 89712
341009

NEW JERSEY DEPARTMENT OF TRANSPORTATION 1035 Parkway Avenue; Trenton, New Jersey, 08625
349871

NEW MEXICO UNIVERSITY, ALBUQUERQUE Albuquerque, New Mexico, 87131
348355, 348354, 348356, 348357

NEW SOUTH WALES DEPT OF MOTOR TRANSPORT, AUSTRALIA 56 Rothschild Avenue; Roseberry, New South Wales 2018, Australia
331446, 345484, 348569

NEW ZEALAND MEDICAL JOURNAL Otago Daily Times, Limited; Box 181; Dunedin, New Zealand
349647

NORTH CAROLINA UNIVERSITY Highway Safety Research Center; Chapel Hill, North Carolina, 27514
361380, 361381, 361615, 361912

NORTH DAKOTA STATE HIGHWAY DEPARTMENT Transportation Services Division; Bismarck, North Dakota, 58505
349858

NURSING RESEARCH American Journal of Nursing Company; 10 Columbus Circle; New York, New York, 10019
348755

O

OFFICE OF THE SECRETARY OF TRANSPORTATION 400 7th Street, SW; Washington, D.C., 20590
335717, 361925, 361924, 364847

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361556

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P

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335717, 361313

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319845

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361596, 361767

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349847, 361310, 361597, 362010

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361315, 361314, 361600, 361753

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348750, 349872, 361607, 361769, 361922, 361921, 364847

R

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S

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361162, 361156, 361171, 361152, 361151, 361166, 361149, 361170, 361163, 361157, 361147, 361165, 361154, 361160, 361167, 361155, 361146, 361158, 361148, 361164, 361168, 361172, 361150, 361161, 361153, 361159, 361169, 361549

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197699, 197709

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348754, 348753, 361377, 361376, 361375, 361752, 361751, 361909

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335161, 335155, 335154, 335162, 335159, 335163, 335160, 335156, 335157, 335158, 342142

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342113

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361327, 361371, 361944

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349852, 349862

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361604

TRANSPORTATION SYSTEMS CENTER 55 Broadway; Cambridge, Massachusetts, 02142
329043, 337224, 344416, 344501, 343739, 347732, 346713, 346161, 347733, 347899, 347884, 364879, 364880, 364878

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Source Index

U

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348752, 362011

V

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VIRGINIA UNIVERSITY Charlottesville, Virginia, 22904
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W

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362008

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WHARTON EFA, INCORPORATED 3264 Science Center; Philadelphia, Pennsylvania, 19104
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361933

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WYOMING STATE HIGHWAY DEPARTMENT Highway Safety Branch, P.O. Box 1708; Cheyenne, Wyoming, 82001
361931, 361930, 361932

Z

ZEITSCHRIFT FUER VERKEHRSSICHERHEIT Tetzlaff-Verlag GmbH; Havelstrasse 9, Postfach 4006; 6100 Darmstadt 1, West Germany
349278, 349275, 349329, 349277

AUTHOR INDEX

The Author Index lists personal authors of papers included in this publication. Under each name are posted the TRIS accession numbers of those abstracts for which the person has been named as author or coauthor.

A

ABBESS, C
361942
ABDEL-HAJIM, MH
345062
ABERNATHY, WJ
361552
ABRAMS, R
318905
ADAMS, FJ
349853
ADAMS, S
361153
ADLAF, E
361039
AGNEW, WG
349660
AGRAN, PF
349887
AIGNER, J
362013
AKASAKA, T
362007
ALBERS, WA, JR
349886
ALEM, NM
361152
ALLEN, SD
361162
ALLSOP, RE
361940
ALPPIVUORI, K
361611
ANDARY, JJ
361312
ANDERSEN, EB
361016
ANDERSSON, K
361318
ANDON, J
344526
ANDREWS, JC
345700
ANDREWS, JS
349844
APPLEYARD, D
335587, 349830
ARENDT, RH
346067, 346068
ARNBERG, L
331215
ARNBERG, PW
331215
ARNOLD, D
314063
ASHFORD, NJ
345207
ASHTON, SJ
348943, 361171
ATTWOOD, DA
361758, 361609
AURILIO, SL
361027

B

BACKAITIS, SH
361149
BAIRD, RC
344623
BAKER, SP
348771, 361369
BALCAR, GP
349846
BANCROFT, D
361016
BANZET, P
361166, 361159
BARNI, E
361751
BARRON, JJ
361027
BARRY, DO
341009
BATES, HJ
361002
BATT, RD
361508
BAUER, RF
361511
BAUM, AS
343667
BAUMAN, R
349864, 361176
BAYOUMI, A
361938
BEDARD, P
361756
BEIER, G
361168
BELLAMY, LJ
361034
BERRY, BH
349838
BIARD, R
361167
BILLING, AM
349877
BISHOP, EW
349493
BITTNER, SR
346163, 346165, 346164
BJORKSTEN, TM
348423
BLACKLEDGE, RD
361304
BLANK, JG
361152
BLOCH, J
361154
BLOCK, MK
361040
BLOMBERG, RD
335158
BOBBIE, BA
361758
BOECHER, W
348943
BOHLIN, NI
348762
BONDY, N
349194
BORGIA, J
361761
BORSINI, G
361179
BOURBEAU, RR
361939
BOWMAN, BM
361148
BOWMAN, MA
361771
BRACKETT, RQ
361181
BRAGG, BWE
346021, 348944, 361936
BREEN, JM
334834
BRENNER, FC
349818, 361510
BRINK, G VAN DEN
349881
BROADHEAD, WG
346016
BRONSTAD, ME
335992
BROUGHAM, D
361169
BROWN, DB
361998
BROWN, RJ
348861
BRUGGEMAN, A
349875
BRYK, JA
349492
BUCHANAN, LS
361566
BUCK, RE
364879, 364880, 364878
BUI GUOC, T
361016
BUNCH, H
337893, 337892
BURCHMAN, PF
361912
BURDEKIN, FM
361017
BURG, A
335154, 335161
BURG, H
361170
BURGESS, JM
361773

BURGESS, WT
361995
BURGOYNE, JH
361017
BURKE, FE
349886
BURNS, M
335718
BUSECK, CR VON
349659
BUTTERFIELD, B
361358

C

CALLAHAN, JM
361599
CAMEL, NA
361909
CAMERON, MH
309861
CAMERON, RA
361036
CAMPBELL, GD
348768
CAMPBELL, JA
344447
CAMPBELL, JD
344446, 344447
CAMPBELL, KL
349257
CANTILLI, EJ
348943
CARPENTER, DW
349260
CARRARO, B
361377
CARRIER, H
361766
CARRIERE, WM
349037
CATTANEO, A
344526
CAYLESS, G
362013
CERULLO, B
361945
CESARI, D
361154
CHAN, G
361038
CHAN, H-S
361157
CHANG, CJ
349642
CHAPMAN, AJ
348943, 348944
CHAPMAN, J
345654
CHAPON, A
361161
CHATTAWAY, LD
349823
CHEN, CKE
349862
CHI, GYH
348770
CHIKAMORI, S
349032
CHILBERT, M
361151
CHINN, BP
361002
CHIPLOCK, LW
346165, 346164, 346163
CHRISTOPHER, RA
361389
CHUNG, L
361039
CIPOLLA, M
361179
CLAXTON, JD
361495
CLAY, TR
361326, 361601
CLAYTON, AB
334834
CLEVEN, A
361572
CLOWES, MA
361758
COHEN, AS
349645
COLE, RE
361360
COLYER, CC
348745
COMPAGNA, M
341523
COOKE, C
361993
COSTA, V
346756, 346755, 361989
COUNCIL, FM
361380, 361381
COURTNEY, AJ
361034
CRENSHAW, RW
319845
CRESPI, I
346122, 346121, 346125, 346123, 346124
CROLLA, DA
349859
CULLER, CJ
344437
CULVER, CC
361163
CUNNINGHAM, JL
344437, 344422
CUSICK, JF
361151
CUTTING, D
345484

D

DAGNONE, LE
348758
DALBY, E
348957
DALEY, KF
348841
DANIEL, RP
361158
DANNER, M
361172
DARZENTAS, J
348943
DAVIES, RF
330774
DAVIS, MW
319845
DAVIS, S
346019
DAWSON, NE
335914, 361936
DEAN, C
348943
DEAN, JD
348943
DEINES, VP
346754, 346765
DEJEAMMES, M
361167
DELEYS, NJ
346680
DENIS, AJR
349664
DERRIEN, Y
361167
DESMOND, WF
361558
DESPER, LP
361380, 361381
DEWAR, RE
335160, 341108
DIJKSTRA, G
349644
DOGOLOFF, LI
361375
DOHERTY, R
349640
DONELSON, AC
318981, 361916
DONNELLY, JH
346175, 346661
DONOHUE, RJ
345179
DOWNING, AJ
349860
DOWNING, CS
348943
DUDLEY, EA
361511
DUDZINSKI, P
362014
DUEKER, RL
346165, 346164, 346163
DUNNE, J
349847

E

EATON, EG
349844
EDELSON, E
361310
EDWARDS, ML
361181
EDWARDS, RP
349880
EILENBERGER, DR
335740
EL-GINDY, M
349035
ELLINGSTAD, VS
361601
ELLIOTT, RB
349647
ELLIS, RH
335717
ELSTON, JC
361373
ENGLAND, L
349876
ENGLISH, JW
349192, 349664
ENNIS, P
361755
EPPINGER, RH
361156, 361155, 361157
ERVIN, RD
344447, 344446
EVANS, L
349658, 349659, 349917, 349916
EWING, C
361151

F

FAMBRO, DB
349882
FAN, W
361149
FANCHER, PS
337893, 337892, 361484, 361613, 361772, 361994, 361908
FARMER, KM
349837
FAVA, NE
347732, 347733
FAYON, A
361166, 361159
FAZAKERLEY, JA
330774
FEDER, KR
361389
FENTON, RE
361042
FERGUSON, AL
349834
FERLIS, RA
361313
FIELDWICK, R
348918
FILKINS, LD
349651
FINN, P
346021
FLADE, A
349278
FLEISCHER, GA
349039, 361016
FLEISSNER, D
314063
FLING, RT
361042
FLORA, JD
345063, 349651, 361312
FLYNN, L
326369
FOOT, HC
348943, 348944
FORBES, TW
335155
FORD, AH
348755
FORREST, L
361560
FOSTER, M
346016
FRANK, L
361355
FUCIGNA, JT
361572
FULLER, RGC
349652
FULTON, ET
334826
FURUHAMA, S
341463

G

GALAWAY, B
346033
GALIN, D
348129
GALLOWAY, DJ
349137
GALSTERER, H
348944
GARRETSON, M
349261
GARROT, WR
364989
GARROTT, WR
318911, 349648
GARVEY, J
361919
GEDDIS, DC
361911
GEILER, M
348943
GERBER, D
345070
GERONDEAU, C
361386
GERSTENBEGER, T
344526
GEURTS, CA
361754
GHENT, WR
348779
GIER, JJ DE
349881

GIPPS, PG
348743
GLINER, J
361761
GLITSCH, G-D
361164
GOGEL, E
362013
GOINS, SE
331743
GOKHALE, DV
361016
GORDON, DA
349646
GOT, C
361159
GOZA, SW
349880
GRANDFIELD, SD
361563, 361562
GRAY, CL, JR
349848
GRAYSON, GB
345075
GREEN, B
361359
GREEN, FS
361384
GREEN, P
361043, 361995
GREEN, RJ
361370
GREEN, RN
348764, 348756
GREENE, DL
349862
GREGORY, DR
361918
GREGORY, FMH
361616
GRIFFIN, LI
345061
GRIMM, AC
344440, 344445
GROSSMAN, AM
362002
GUDGEON, AC
349649
GUENTHER, D
364989
GUO, K
361908

H

HAAS, GC
349527
HADDON, W, JR
361369
HAGEN, RE
349262, 361031
HAIGHT, FA
341441
HAKKERT, AS
345060
HALLAQ, JH
346713
HALSTEAD-NUSSLOCH, R
335159, 345180
HAMAMOTO, Y
361775
HAMES, LN
341439
HAMILTON, EG
361615
HAMILTON, WF
349037
HAND, DH
343716, 343713, 343681, 346118
HAND, HD
346117
HANEY, J
349257
HANKINS, KC
345061
HANSCOM, FR
342376
HARIGAYA, Y
361488
HARMON, JA
361177
HARMS, PL
341634
HARRES, M
361164
HARRIS, SS
361321
HARRISON, G
361307, 361501
HART, D
348569
HARTEMANN, F
361150
HARVEY, MR
318413
HATHAWAY, WT
347884
HEARNE, R
349508
HEDBERG, GE
348423
HEDDEN, FJ
349834
HEDLUND, J
361016
HEGMON, RR
361753
HENDERSON, R
330774
HENSON, DL
361485, 361324
HERBERT, DC
331446, 345484
HESS, RL
349890
HILL, CS
361485
HILL, R
362010
HILLMAN, JC
348915
HILLS, BL
348748
HILLS, FJ
349828
HINDMARCH, I
349649
HIPPEL, F VON
349848
HODGDON, JD
346021
HOGUE, JR
346699, 346698, 346700
HOLDEN, RT
344505
HOLLINGSWORTH, L
329043, 337224
HOLROYD, HJ
348775
HOLZ, S
349277
HOPKIN, JM
334866
HORE, T
349844
HORIUCHI, K
361762
HORVATH, S
361761
HOSKIN, A
349492
HOUK, R
364989
HOUTERMAN, C
361151
HOWARD, RA
349886
HOWARD, V
349255
HOWARTH, CI
348944
HOWETT, GL
344258, 361317
HOYOS, CG
348944
HRICKO, AR
361026
HUBER, KR
344445, 344440
HUDDART, KW
348943
HUELKE, DF
348760, 348778, 361152, 361312
HUGHES, EC
344422
HULL, M
348914
HUMPHREYS, M
349657
HURLEY, C
348753, 361752
HUTTICH, RC
362003

I

IIJIMA, T
349826
IKEDA, Y
361481
INAGAWA, M
349831
INAMI, H
361483
INOUE, S
361311
INOUE, T
361487
IVEY, DL
345061
IWASE, S
361489

J

JACOBS, G
346670, 346181
JACOBS, GD
348748, 349860
JACOBS, HH
335158
JANICKI, E
348749
JANKE, MK
349253
JARRETT, D
361942
JEFFERY, DJ
334829, 341402
JEPSEN, RL
346754, 346765
JOHNSON, HD
330775
JOHNSON, N
346019
JOHNSON, W
349833
JOHNSTON, IR
329640
JOKSCH, HC
361512
JONAH, BA
335914, 361936
JONES, B
346134
JONES, RK
318981, 361914, 361927, 364988
JONES, TO
361306
JONSSON, B
348423
JOSCELYN, KB
318981, 361916, 361915, 361927, 361928, 361926, 361914, 364988
JOUBERT, PN
348766
JURGEN, RK
361029

K

KAESTNER, N
361033
KALDOBSKY, PR
347733, 347732
KALLIERIS, D
361156, 361164
KANNEMAN, K
361365
KARPF, RS
361041, 361321, 361759
KASHIMA, S
361320
KEARNEY, EF
349663, 349661
KECECIOGLU, KC
344526
KEEGEL, JC
361016
KEENEY, AH
361919
KELSEY, SL
349253
KENNEDY, RH
361499
KERNISH, R
344506
KHADIKAR, AV
346755, 346756, 346144, 346146, 346145, 346143
KHADILKAR, AV
361990, 361989
KILGORE, SB
344623
KIMBALL, CE, JR
335992
KINGSBURY, DC
348354
KIRBY, D
335914
KIRKBY, C
334826
KITAJIMA, H
361311
KITTO, HJ
349829
KLEIN, RH
346698, 346699
KOBAYASHI, M
361481
KOCH, GG
361937
KOGANEMARU, S
361487
KONDO, A
361510
KOSHI, M
361320
KOSSAR, JM
342113
KOURIK, JW
349863
KOZAWA, K
361490

KRALL, FL
348364
KRAMER, U
348943
KRAUSE, JL
361571
KRAUSE, PB
197699, 197709
KREMER, DP
344623
KROELL, CK
361162
KROJ, G
348943
KUBACKI, M
344609
KURIHARA, K
361606
KUROIWA, S
361490

L

LABERGE-NADEAU, C
361939
LAITAKARI, P
361611
LALANI, N
361376
LAMBERT, JP
346754, 346765
LANGWIEDER, K
361172, 361149
LAPPEN, AA
361498
LARRANAGA, LA
348355
LARSON, SJ
361151
LASSARRE, S
361016
LATOUR, R
361939
LAVE, LB
349653
LAWSON, JJ
349885
LEAF, WA
335158
LEE, WB
361560
LEINO, M
345178
LEIS, B
361164
LENNON, D
349647
LESAGE, PB
361030
LESCZHIK, JA
318413
LESUEUR, O
329043, 337224
LEUNG, YC
361166, 361159
LEUTZBACH, W
349277
LEWIS, GD
361357
LEWIS, RL
344623
LI, LK
361912
LIGHTBURN, A
348944
LIMBOURG, M
345070
LIN, J
364989
LINER, SA
349662
LINKLATER, D
348569
LITMAN, T
319845
LLOSVAI, L
349035
LONERO, LP
348767
LOOBY, LF
344501
LOXLEY, CJ
346161
LOZZI, A
345654, 345484, 349036
LUCE, P
346161
LUDTKE, NF
362012
LUDWIG, GS
349818
LUMMIS, M
349813
LYLES, RW
347920, 347921, 347741
LYNN, C
335739
LYTTON, RL
345061

M

MAAG, U
361939
MACADAM, CC
361484
MACDONALD, D
346686
MACKAY, GM
345699, 348761
MAGHSOODLOO, S
361998
MAIDER, RK
349643
MAIRESSE, P
361166
MAISEY, GE
349152
MALTHA, J
361165
MANKER, E
344505
MARCUS, JH
361155
MAREK, S
343714
MARKS, ME
318981, 364988
MARTIN, DE
348769
MARTIN, M
364989
MASON, RL
343739
MASON, RT
361169
MATSUSHITA, S
361487
MATTERN, R
361164, 361156
MAXWELL, DM
346111
MAYER, RC
344443
MAYHEW, DR
349527
MCBRIDE, RS
346134
MCBURNEY, LJ
361758
MCCANN, MK
349867
MCCARTHY, PE
334834
MCCONNELL, EJ
361031
MCCOOMB, LA
349852
MCDONALD, N
349878
MCDOUGALL, GHG
361495
MCDOWELL, MRC
348943
MCGEE, MP
349880
MCGUIGAN, DRD
348128
MCGUIGAN, R
342083, 349194
MCKEOWN, B
361596
MCLEAN, J
341403
MCLEAN, RF
318413
MCMINN, MS
351499
MCNAIR, JW
364988
MCNEIL, K
361509
MCPHERSON, K
346109
MCSWAIN, NE, JR
349813, 361387
MCTAGGART, S
349844
MCVETTY, TN
343728
MEISNER, RP
347899
MELVIN, JW
348772, 349890, 361152
MERCER, L
344526
MICHIE, JD
331278
MICHON, JA
345065
MIERAU, D
341009
MILLER, PM
346067, 346068
MILLER, RE
361509
MILLER, T
349492
MILNE, L
349038
MITCHELL, B
318905
MIYAKAWA, H
361481
MIYAZAKI, T
361488
MOHAN, D
361148
MOLEN, HH VAN DER
302437, 345067
MONK, MW
344504
MOORE, GH
346199
MORE, M
345062
MORECRAFT, LM
349037
MORGAN, RM
361155
MORGAN, W
344526
MORISAKI, K
361361
MORISAWA, M
361606
MORITA, T
361482
MOURANT, RR
345021
MOUSSA-HAMOUDA, E
345021
MUELLER, JK
319845
MUNZ, PM
344438
MURTLAND, WO
361356
MYKLEBUST, J
361151

N

NAGAMACHI, M
361173
NAGAOKA, T
361173
NAGAYAMA, Y
361173, 361482
NAGY, B
361590
NAHUM, A
361153
NAKAI, M
361482
NAKAJIMA, M
361483
NAKAJIMA, Y
349826
NAKAMURA, K
349831
NAKANISHI, K
361487
NAKANO, M
361489
NAMAN, TM
344416
NARBUT, AN
349034
NASH, WJ
344443
NEL, PW
348944
NELSON, TM
348944
NEMECEK, J
361303
NEUBERT, W
348943
NEWTON, TM
345061
NICHOLL, JP
348943, 361774
NICHOLS, JL
361601
NIEDERER, PF
361150
NILSSON, G
361318
NISONGER, RL
361772, 361908
NOGUCHI, K
361481
NOLAN, J
361016
NOLD, FC
361040
NUSHOLTZ, GS
361152

O

O'BRIEN, JP
361382

- **O'DAY, J**
  - 345063, 344598, 337893, 337892, 344609, 348759, 361312
- **O'NEILL, B**
  - 361912
- **OAKS, RL**
  - 361600
- **OATES, JF, JR**
  - 349493
- **ODSELL, O**
  - 361383
- **OHIGASHI, S**
  - 361775
- **OHMAE, H**
  - 361606
- **OKAMI, Y**
  - 361606
- **OLSEN, RA**
  - 335156, 341441
- **OLSHAN, MD**
  - 197709
- **OLSON, PL**
  - 335159, 345179, 345180, 349837, 361485, 361324, 361486
- **OMMAYA, A**
  - 361149
- **OOSHIKA, H**
  - 361487
- **OPPE, S**
  - 361016
- **OPPENHEIM, T**
  - 344512
- **ORNE, DE**
  - 361378
- **ORR, BT**
  - 361381, 361380
- **OSIECKI, T**
  - 346161
- **OTTE, D**
  - 349329
- **OUCHTERLONY-JONSSON, KE**
  - 348423
- **OZAKI, K**
  - 361481
- **OZORIO, P**
  - 362001

P

- **PACEJKA, HB**
  - 349825
- **PAIN, RF**
  - 335162
- **PANDOLFI, G**
  - 361179
- **PARTYKA, S**
  - 361016, 361149
- **PATEL, A**
  - 361159
- **PATEL, AR**
  - 349137
- **PATEL, HP**
  - 361499
- **PATRICK, LM**
  - 361160
- **PECK, RA, JR**
  - 361917
- **PECK, RC**
  - 349261, 349260, 361031
- **PENTZ, CA**
  - 344437, 344422
- **PEPLER, RD**
  - 361572
- **PEREZ, JM**
  - 349828
- **PERROTT, J**
  - 346109
- **PERRY, DR**
  - 329640
- **PETERS, GA**
  - 361308
- **PETRUCELLI, E**
  - 341439, 348756
- **PHILIPSON, LL**
  - 349039, 361016
- **PHILPOT, JW**
  - 344422
- **PIERCE, JA**
  - 348767
- **PLANEK, TW**
  - 348944, 349492
- **POPE, ME**
  - 361162
- **POPKIN, CL**
  - 361912
- **POST, DV**
  - 345179
- **POWERS, RD**
  - 348356
- **PRIETO, T**
  - 361151
- **PULLING, NH**
  - 349889

R

- **RAASCH, F**
  - 361153
- **RACE, K**
  - 349492
- **RAKOWSKI, JP**
  - 361764
- **RAMET, M**
  - 361154
- **RAMO, S**
  - 349884
- **RAPOPORT, A**
  - 348944
- **RASHTI, P**
  - 349039, 361016
- **RAU, H**
  - 361170
- **RAUB, RA**
  - 349888, 361492
- **RAVANI, B**
  - 361169
- **REID, LD**
  - 349877
- **REILLY, PM**
  - 361511
- **REINFURT, DW**
  - 346018, 348770, 361912
- **RENNER, R**
  - 344526
- **RENNIE, AM**
  - 348944
- **RICE, JN**
  - 344505
- **RICE, RS**
  - 346170
- **RIEMERSMA, J**
  - 361016
- **RILEY, BS**
  - 361002
- **RINDE, EA**
  - 361044
- **RISK, A**
  - 348944, 348943
- **RITCHIE, JRB**
  - 361495
- **ROBERTS, G**
  - 348773
- **ROBERTSON, LS**
  - 349654
- **ROBINSON, A**
  - 346109
- **ROCHE, S**
  - 361761
- **RODENRYS, K**
  - 346161
- **ROHR, PR**
  - 361148
- **ROHTER, L**
  - 343714
- **ROLAND, HE**
  - 361016
- **RONAN, L**
  - 361552
- **ROPER, WL**
  - 361943
- **ROSS, BW**
  - 341009
- **ROSS, P**
  - 361315
- **ROSSOW, GW**
  - 348364
- **ROTHENGATER, JA**
  - 345069
- **ROTHENGATTER, JA**
  - 302437
- **ROTHENGATTER, T**
  - 348943, 349644, 349879
- **RUBIN, AI**
  - 344258, 361317
- **RUDEN, RJ**
  - 335161
- **RUDMAN, L**
  - 329043, 337224
- **RUDRAM, DA**
  - 361017
- **RUPPENTHAL, KM**
  - 361763
- **RUSCHMANN, PA**
  - 361928, 361926, 361916, 361915, 361914
- **RUSSELL, ER**
  - 346765, 346754
- **RUYTER, L DE**
  - 349644
- **RYAN, BE**
  - 361907
- **RYDER, DA**
  - 361017

S

- **SAITO, T**
  - 349826
- **SAKAI, H**
  - 361776
- **SALTZBERG, B**
  - 361151
- **SALUTIN, L**
  - 361038
- **SANCES, A, JR**
  - 361151
- **SANO, S**
  - 341465
- **SARELLE, E**
  - 345060
- **SATO, TB**
  - 361606
- **SATTERTHWAITE, SP**
  - 348933
- **SAYER, IA**
  - 349860
- **SAYERS, M**
  - 337893, 337892
- **SCANLON, M**
  - 362008
- **SCHAEFFER, KH**
  - 329043, 337224, 346713
- **SCHELLMANN, B**
  - 349269
- **SCHILLERSTROM, K**
  - 361763
- **SCHMIDT, G**
  - 361156, 361164
- **SCHNEIDER, D**
  - 361153
- **SCHNEIDER, EW**
  - 361032
- **SCHNEIDER, LW**
  - 348776, 361045, 361148
- **SCHORR, DJ**
  - 361999
- **SCHUEFTAN, O**
  - 335717
- **SCHUETZLE, D**
  - 349828
- **SCHULLER, E**
  - 361168
- **SCHULTZ, M**
  - 361767
- **SCHWARZ, R**
  - 344526
- **SCHWING, RC**
  - 349886
- **SCOTT, D**
  - 361597
- **SCOTT, PL**
  - 361609
- **SCOTT, RA**
  - 318905, 318911, 349648
- **SCOTT, RE**
  - 344598, 361571
- **SCOTT, WM**
  - 361491
- **SEIDENSTECHER, K**
  - 348765
- **SELBY, PH**
  - 346162
- **SENDELBAUGH, JW**
  - 361035
- **SHARPE, GS**
  - 348764
- **SHEEHY, NP**
  - 348944, 349836
- **SHELTON, EM**
  - 349855
- **SHEPPARD, D**
  - 330774, 348943
- **SHIELS, AC**
  - 348774
- **SIEGEL, HM**
  - 344526
- **SILCOCK, DT**
  - 349622
- **SIMANAITIS, D**
  - 349850
- **SIMEONE, LF**
  - 349643
- **SIMMONDS, AG**
  - 361322
- **SIMPSON, HM**
  - 348763, 348944, 349823, 349527
- **SIU, TO**
  - 348758
- **SIVAK, M**
  - 335159, 345059, 345179, 345180, 349837, 361316, 361486, 361324, 361485, 361779
- **SMALLEY, WM**
  - 361560
- **SMALTZ, JJ**
  - 346754, 346765
- **SMITH, DT, JR**
  - 335587, 349830
- **SMITH, GA**
  - 335914
- **SMITH, HJ**
  - 335157
- **SMITH, RN**
  - 361044
- **SOLOWKA, EN**
  - 349877
- **SOSKTOWSKI, RH**
  - 344443
- **SPANN, W**
  - 361168
- **SPEARS, GF**
  - 361911
- **STACEY, S**
  - 349883

STALNAKER, RL
361165
STAPP, JP
361147
STATES, JD
341439, 348777
STENQUIST, P
361309, 361354
STEUART, GN
349852
STEWART, LT
344505
STOKE, CB
349256
STOTZ, E
348944
STROUD, PG
334826
STRUCKMAN-JOHNSON, DL
361601
STUERTZ, G
361170
STURGIS, SP
349889
SUENAGA, K
361483
SULLIVAN, LK
344504
SUMMALA, H
345178, 341109
SUZUKI, H
361482
SUZUMURA, A
361173, 361483
SWEAT, GL
349888
SWENSON, PR
361326, 361601
SWINEHART, JW
344439
SZOSTAK, HT
346698, 346699

T

TAKAGI, Y
349826
TAKAHASHI, K
361361
TAKIZAWA, K
361482
TANABE, S
361775
TARRANTS, WE
326369
TARRIERE, C
361166, 361159
TAYLOR, DH
349835
TAYLOR, JI
348754
TAYLOR, T, JR
362012
TEDFORD, JD
349038
TESTIN, FJ
341108
THOMAS, C
361150
THOMAS, D
361151
THOMSON, GA
349857
THORNTON, J
348752
TOMERLIN, J
361765
TOTH, WJ
361549
TRAUCHESSEC, R
361161
TREAT, JR
361926, 361928
TRENNE, MU
361306
TRESER, W
361302
TRINCA, GW
331215, 348757
TSUJIMURA, A
361482
TSUKIO, Y
361311
TURRIAN, V
361303

U

ULMER, RG
346199

V

VAILLANCOURT, DR
349889
VALENTOUR, JC
349880
VAN COTT, D
349839
VAN POOL, C
349840
VANLER, T
348943
VASQUEZ, JE
361907
VAYDA, A
346123, 346124, 346125, 346121, 346122
VERRIEST, JP
361161
VIANO, DC
361162, 361163
VIERGUTZ, OJ
343728, 343714
VIERIMAA, J
345178
VIGIL, JO
348357
VINGILIS, E
361039, 361038, 361755
VINJE, MP
302437, 345068

W

WACHTEL, J
361314
WADE, FM
348944, 348943
WAGENAAR, AC
361319
WAGNER, J
361761
WAGNER, M
346686
WAKELY, HG
343728
WALSH, P
361151
WALTON, AC
349833
WALZ, FH
361150
WARD, C
361153
WARD, H
348957
WARNER, CY
361162
WARREN, RA
348944, 348763, 349823, 349527, 361365
WARTBURG, RJ
349655
WASIELEWSKI, L
349659
WASIELEWSKI, P
349658, 349917
WATANABE, Y
349861
WATSON, GS
349814
WATSON, ID
361508
WATSON, PE
361508
WATTS, GR
361507
WEBB, PJ
330780
WEBER, K
349890
WEBER, R
361151
WEEBER, S
349650
WEHRLI, B
361303
WEISS, MJ
361028
WELBOURNE, ER
348768, 349885
WELLS, JK
361912
WENNELL, J
348943
WEST, LHT
349844
WESTENBERG, D
329043, 337224, 346713
WHITAKER, LA
349883
WHITE, ME
334829, 341402
WHITTINGTON, RM
349856
WIECKING, DK
349880
WIGAN, MR
361385
WILKS, A
349814
WILL, E
346145, 346144, 346756, 346146, 346755, 346143, 361989, 361990
WILLETT, P
349454
WILLIAMS, AF
331743, 349254, 361041, 361321, 361759
WILLIAMS, CL
349256
WILLIAMS, H
361605
WILLIAMS, MJ
345064
WILLIAMS, RB
346196
WILLIAMS, RL
349262, 349828
WILLUMEIT, H-P
348943
WILLUMSEN, LG
345868
WILSON, DL
349648
WILSON, JR
348944
WILSON, T
348944
WINKLER, CB
337893, 337892, 361913, 361994, 361908
WITTINGSLOW, GE
349442
WOOD, AS
348747
WOODSON, WE
346162
WOOTTON, P
349260
WRIGHT, CC
361942
WRIGHT, CT
349819
WYNNE-JONES, JD
348022

Y

YAGI, T
361037
YARMUS, J
329043, 337224
YOSHIDA, M
361488
YOSHIKAWA, N
349032
YOST, CD
361158
YOUNG, WE
344598

Z

ZADOR, PL
349814, 361321
ZAIDEL, DM
345060
ZEIDLER, F
361170
ZIMMERMANN, G
349275
ZIMOLONG, B
348943
ZINKE, DT
346016
ZUB, RW
343739, 347899
ZWAHLEN, HT
335163
ZYVOLOSKI, M
361151

RETRIEVAL TERM INDEX

The Retrieval Term Index contains terms that have been selected from the title and abstract of each document record published in this issue. Posted under each term are the six-digit TRIS accession numbers for those document records that relate to the term. For example, ACOUSTIC EQUIPMENT is a descriptor for record 361311 on page 74.

A

ABBREVIATED INJURY SCALE
341439, 361150, 361149
ABDOMEN
361171, 361163, 361167, 361165, 361166
ABSORPTION
349881
ACCELERATION
343713, 343681, 343667, 343716, 346170, 346117, 346019, 349035
ACCIDENT AVOIDANCE
346019, 349877, 349887
ACCIDENT BENEFIT ANALYSIS
361563, 361562
ACCIDENT CAUSES
342142, 345059, 348364, 348944, 349816, 349823, 349876, 349854, 349868, 361180, 361493, 361602, 361995, 361914, 361931
ACCIDENT COSTS
348918, 349820, 349496, 349622, 349858, 361027, 349868, 361044, 349854, 361312, 361377, 361494, 361382, 361914
ACCIDENT EXPOSURE
344609, 348727, 361614
ACCIDENT INVESTIGATION
349194, 349275, 349137, 349454, 349836, 349657, 349854, 349876, 349890, 361017, 361169, 361304, 361180, 361364, 361363, 361762, 361589, 361566, 361588, 364989
ACCIDENT INVESTIGATION SITES
349038, 349328
ACCIDENT PREVENTION
330775, 334826, 335156, 197699, 344111, 337893, 337892, 348022, 346670, 349193, 348751, 348957, 349278, 349496, 349622, 349882, 361059, 361031, 349860, 361375, 361497, 361779, 362011, 362002
ACCIDENT PRONE DRIVERS
349261, 361031, 361936
ACCIDENT PRONE LOCATION
348128, 348957, 349256, 349641
ACCIDENT PRONENESS
349647, 361369, 361936, 361937
ACCIDENT RATES
132132, 345061, 345063, 348128, 346111, 348914, 348728, 348841, 348933, 349277, 348918, 348861, 348944, 349257, 348727, 349253, 349329, 349814, 349527, 349829, 349868, 361041, 361038, 349878, 349858, 361039, 349866, 361044, 361180, 361362, 361361, 361382, 361512, 361759, 361907, 361602, 361614, 361922, 361930, 362015, 361944, 361999, 361933
ACCIDENT RECONSTRUCTION
346117, 346118, 349269, 361170, 361389, 361762, 364989
ACCIDENT REDUCTION
335739, 345061, 345060, 345064, 348364, 348943, 349891, 361044, 361388, 361382, 361494, 361493, 361497, 361376, 361759, 362002, 361922, 361996
ACCIDENT REPORTS
309861, 344111, 348355, 348354, 349254, 349039, 349269, 349137, 348744, 349816, 349815, 349495, 349836, 349658, 349454, 349822, 349821, 349871, 349858, 349870, 349854, 361180, 361363, 361493, 361364, 361497, 361362, 361774, 361771, 361588, 361602, 361589, 361770, 361615, 361931, 361932, 361930, 362006, 362004, 361933
ACCIDENT RETURN FORMS
361771
ACCIDENT SEVERITY
335740, 331215, 331278, 330775, 197699, 344609, 344111, 342083, 346018, 348357, 349137, 349255, 348356, 348757, 349827, 349829, 349842, 361150, 361149, 361148, 361044, 361002, 361016, 349871, 361180, 361566, 361770, 361928, 361926, 361933, 362015, 361999, 361930
ACCIDENT SEVERITY RATE
349814, 349813, 361178, 361939, 361938
ACCIDENT TYPE
349194, 348744, 349642, 349647, 349866, 349870, 349871, 349868, 361180, 361362, 361591, 361770, 361602, 361939, 361996, 361930, 362015, 361933
ACCIDENT VICTIMS
348569, 349647, 349870, 361041, 361362, 361361, 361770, 361593, 361602, 361930, 361992, 361933
ACCIDENTS
346756, 346755, 348770, 349835, 349651, 349820, 349865, 361172, 361175, 361298, 361168, 361493, 361760, 361589, 361779, 361588, 361753, 361591, 361912, 361942, 361933, 361930, 361939, 362003, 361932, 361998
ACCURACY
349836, 349889, 361492, 361923
ACOUSTIC EQUIPMENT
361311
ACOUSTICS
361510
ADJUDICATION
314063, 346109
ADMINISTRATION
349275, 349888, 361378
ADMINISTRATIVE ORGANIZATION
361059
ADULTS
345070
ADVERTISING
346661, 346175

ADVERTISING CAMPAIGN
344439, 344445, 349442, 361495
AERODYNAMIC CONFIGURATIONS
349847
AERODYNAMICS
344526, 349848, 349847
AGE
345068, 345063, 361171, 361377, 361911
AGGRESSION
361316
AGGRESSIVITY
361172
AGING
334866
AIR BAGS
346680, 349839, 361564
AIR BRAKES
349257, 349821, 361484
AIR CUSHION
346016
AIR FLOW
362013
AIR POLLUTION
349037, 361373, 361374, 361769
AIR TRANSPORTATION
341523
AIR-INJECTION REACTION SYSTEMS
362010
ALARM SYSTEMS
349640
ALCOHOLISM
349651, 349493, 361755
ALCOHOLS
341463
ALGORITHMS
349877
ALIGNMENTS
341403
ALL-WEATHER DRIVING
361302
ALLOCATION MODELS
349888
ALTERNATIVES
341463, 361926, 361925, 361924
ALTERNATORS
361945
ALUMINUM
349867
AMBULANCES
361571, 361567
AMENDMENTS
361915
ANALYSIS
349642, 361588
ANALYSIS OF VARIANCE
349889
ANALYTICAL METHOD
349828
ANIMALS
361151, 361161, 361162
ANIMATION
361314
ANTHROPOMETRY
346145, 346756, 346755, 348423
ANTI-KNOCK
349855
ANTI-LOCK BRAKES
361484
ANTI-ROLL BARS
349850
ANTI-THEFT DEVICES
361501, 361943
ANTI-THEFT SYSTEMS
349640
ANTISKID DEVICE
361042, 361605
APPLICATIONS
361357, 361370
APPURTENANCES
331278
AQUAPLANING
361302
ARM
361154
ARREST
349651
ARROW /TRAFFIC CONTROL/
335162, 349883
ARTERIAL STREETS /URBAN/
348957, 361320
ARTICULATED VEHICLES
362014
ASAP /ALCOHOL SAFETY ACTION PROGRAM/
197699, 197709, 346196, 361601
ASSESSMENTS
132132, 347732, 347733
ASSIGNMENTS
349888
ATTENTION VALUE
349646
ATTITUDES /MENTAL/
335718, 334834, 335914, 344422, 344437, 346686, 346713, 361751, 361911
AUDIO VISUAL AIDS
345069, 346165, 349644
AUSTRALIA
348545
AUTISTIC CHILDREN
361366
AUTOMATIC CONTROL
348756
AUTOMATIC SAFETY EQUIPMENT
346162, 348768, 348771, 348769, 348770
AUTOMATIC TRANSMISSIONS
349034, 361597, 362009
AUTOMATIC VEHICLE IDENTIFICATION
361943
AUTOMATION
349889, 361490
AUTOMOBILE ASSEMBLY PLANTS
361490
AUTOMOBILE BODIES
344501, 349036, 348747, 349820, 349867, 349849, 361353
AUTOMOBILE DRIVERS
341634, 349865
AUTOMOBILE ENGINES
344416, 361040, 361491
AUTOMOBILE INDUSTRY
347733, 347732, 349494, 349817, 349838, 349656, 361029, 349864, 361305, 361490, 361509, 361360, 361616, 361997
AUTOMOBILE MAKES
349824
AUTOMOBILE OWNERSHIP
334866, 361385
AUTOMOBILE USE
334866, 349827, 349865, 361385
AUTOMOBILES
331215, 329043, 344506, 343714, 344512, 343739, 345063, 345060, 343667, 342113, 344598, 341463, 343728, 344526, 345654, 346016, 348356, 346142, 346661, 346713, 349032, 349490, 349034, 349845, 349653, 349654, 349494, 361147, 361028, 349862, 349864, 361174, 361325, 361179, 361362, 361498, 361551, 361500, 361763, 361766, 361777, 361908, 361772, 362006, 362005, 362009, 361934, 362013, 362010, 362008, 361944, 361930, 362002, 361943, 361935, 361929, 361912
AUTOMOTIVE SYSTEMS
361590
AUXILIARY LIQUID FUEL TANK
361935
AVAILABILITY
349656
AXLES
362009

B

BACKING
361768
BARRICADES
335162
BARRIER TYPES
331278, 335992, 343681, 343713, 361371
BARRIERS
335162, 346117, 346118

BATTERIES
349640, 361305
BAYES THEOREM
361511, 361942
BEFORE AND AFTER STUDIES
330774, 345063, 345060, 346686, 348841, 349152, 349257, 349508, 361320, 361318
BEHAVIOR
345067, 345070, 345068, 345069, 345065, 348743
BENDING
349032
BENEFIT COST ANALYSIS
132132, 337892, 348569, 348754, 349260, 349622, 361044, 361312, 361924, 361925
BENEFITS
349656, 349655, 361382, 361752, 361997
BIAS
349836, 349844
BIAS BELTED TIRES
361355
BIAS PLY TIRES
361355
BIBLIOGRAPHIES
326369, 341439
BICYCLE RIDERS
335163, 319845, 349329, 349816, 361002, 361175, 364988
BICYCLES
319845, 348728, 349647, 349664, 361507, 361944, 362006
BILINGUAL
361030
BIOCHEMISTRY
349881
BIOMECHANICS
349497, 349890
BLACK SPOTS
348128, 361942
BLINDNESS
361311
BLOOD ALCOHOL LEVEL
334834, 346686, 349823, 349880, 349881, 361508, 361365, 361570, 361569, 361920
BLOOD TESTS
349880, 361508
BLOOD WATER FRACTION
361508
BLOWOUTS
361308
BOATS
361596
BRAIN
341634, 361151, 361485
BRAKE BLOCKS
361507
BRAKE EFFICIENCY
349822
BRAKES /FOR ARRESTING MOTION/
343714, 337893, 337892, 349822, 361042, 361507, 361354, 361592, 361566, 361599, 361589, 361923, 362013
BRAKING
318911, 318905, 344446, 345179, 344447, 349035, 349497, 361037, 361484, 361563, 361994, 361923, 364989
BRAKING LIGHTS
345179, 349837
BRAYTON SYSTEM
361040
BREAKAWAY BASES
341009
BREAKAWAY SUPPORTS
348355
BREATH TESTS
346686, 346123, 361039, 349875, 361038
BRIDGE RAILS
361371
BRIDGES
348355, 361363
BRIGHTNESS
335158, 335155, 335161, 335157
BROKERAGE
361769
BUDGETING
361385
BUILDINGS
361017
BULK CARRIERS
361364
BUMPERS
342113, 361305, 361174, 361304, 361564, 361562, 361594
BUMPS
349830, 361611
BUS DRIVERS
361388, 361363
BUS OPERATORS
361363
BUS TRANSPORTATION
348750, 361607
BUS TRANSPORTATION /INTERCITY/
361493, 361363, 361592
BUS TRANSPORTATION /INTRACITY/
335717, 361771
BUSES /VEHICLES/
346145, 349034, 349821, 349815, 349865, 361353, 361179, 361362, 361778, 364879, 361934, 361935, 361990
BUSINESS
361921
BUSINESS ACTIVITY
361498
BUSINESSMEN
361756

C

CABS /EXCEPT TAXICABS/
344609, 361002
CADAVERS
361153, 361152, 361151, 361165, 361166, 361164, 361155, 361157, 361154
CALIBRATIONS
344623, 345868, 346068, 346067, 348745, 349643
CAMERAS
345654
CAPACITY
325077, 348914
CAR FOLLOWING
348743
CAR POOLS
349840
CARBOHYDRATES
349881
CARBON MONOXIDE
361374, 361373, 361761
CARBURETORS
349643
CARDIOVASCULAR SYSTEM
341634
CASE STUDIES
349254, 349830, 361378, 361762
CATALOGS /PUBLICATIONS/
344445
CATALYSTS
361487
CATALYTIC CONVERTERS
361032, 361487
CAUSES
346755, 346756, 361369
CENTER OF GRAVITY
343667
CENTRAL DIFFERENTIAL
361302
CENTRALIZATION
346190, 346191
CERVICAL CORD
361593
CHAINS
361605
CHANGEABLE MESSAGE SIGN
342376, 361314
CHANGES
335740, 348841, 349256, 361924, 361925
CHANNELIZATION
335162
CHARTER BUSES
349821
CHEMICAL ANALYSIS
349828, 349855, 361372

CHEMICAL COMPOSITION
361372

CHEMISTRY
348729

CHEST
361045, 361162, 361158, 361163

CHILD RESTRAINTS
331446, 331215, 344422, 345699, 344437, 348756, 348755, 349038, 348775, 348773, 349493, 348772, 348774, 349655, 349496, 349832, 349497, 349887, 361177, 361380, 361381, 361369, 361911, 361598, 361752, 361928, 361917

CHILDREN
348746, 349647, 349644, 361602

CHOICES
349842

CITIES
361377, 361921

CITIZEN BAND RADIO
361567, 361595

CIVIC CENTERS
361381

CIVIL ENGINEERS
348754

CLAIMS
349824, 349820, 361178, 361174, 361368, 361512, 361367

CLASSIFICATION
348545, 349657, 361603

CLEAN AIR ACT
361756

CLEARANCES
346162

CLOTHING
334826, 335158, 335159

CLUTCHES
362009

CODING
362004

COLD START
344416, 361506, 361383

COLLAPSE
349839

COLLISION INJURY RESEARCH
341634, 346145, 346146, 346144, 346143, 361045, 361154, 361153, 361148, 361150, 361151, 349890, 361152, 361149, 361146, 361147, 361164, 361170, 361165, 361158, 361163, 361156, 361161, 361155, 361162, 361160, 361159, 361166, 361171, 361169, 361168, 361167, 361157, 361172, 361371, 361990

COLLISION RESEARCH
331278, 343667, 343713, 343681, 344512, 343716, 342113, 346118, 346117, 361371, 361606

COLLISION TESTS
335992, 346067, 346680, 346145, 346144, 348569, 346755, 346756, 346016, 346146, 346019, 346143, 346068

COLLISIONS
345063, 348356, 349254, 348933, 349152, 349820, 349527, 349916, 361298, 361174, 361178, 361512, 361387, 361592

COLOR
335155, 335157

COMBUSTION
349861, 361594

COMFORT
348762, 361611

COMMERCE
361921

COMMERCIAL BUILDINGS
361773

COMMERCIAL VEHICLES
349039, 361016, 361180, 361913

COMMUNICATION SYSTEMS
361943

COMMUNICATIONS
349496

COMMUNITIES
346033, 346754, 346765

COMMUNITY SUPPORT
346109

COMMUTER BUSES
361363

COMPACT CAR
349851, 349837, 361298, 361912

COMPARATIVE ANALYSIS
361557, 361559

COMPARISONS
334866, 331215, 335740, 325077, 318981, 361908, 361912

COMPETITION
347732, 347733, 361360, 361756

COMPLIANCE
346122, 346199, 346134, 349442, 349825, 361754

COMPLIANCE TESTS
361036, 361941

COMPONENTS
361309, 361357, 361500

COMPOSITE MATERIALS
361357

COMPRESSION
361163, 361162, 361387

COMPUTER AIDED DESIGN
361037, 361165

COMPUTER APPLICATIONS
344512, 361037, 361490

COMPUTER GRAPHICS
361600

COMPUTER PROGRAMS
318905, 318911, 344512, 361940, 364880, 364878, 364879

COMPUTER SIMULATION MODELS
361148, 361613, 361908

COMPUTER SIMULATIONS
344512, 347899, 348743, 361037, 361487, 361484, 364878, 364879, 364880

COMPUTER STORAGE
348354, 361325

COMPUTER SYSTEMS COMPONENTS
349184

COMPUTERS
361315

CONCEPTS
346187, 346189, 346188, 346190, 346191

CONCRETE STRUCTURES
335162

CONES
335162

CONFERENCES
335154, 347897, 349496, 361152, 361149, 361147, 361151, 361146, 361150, 361155, 361153, 361148, 361154, 361016, 361161, 361165, 361171, 361170, 361157, 361163, 361156, 361167, 361160, 361169, 361159, 361172, 361164, 361166, 361158, 361168, 361162, 361594

CONFORMITY
349663, 349661

CONSERVATION
349497

CONSPICUITY
361566

CONSTRAINTS
362014

CONSTRUCTION
361355

CONSTRUCTION EQUIPMENT
361549

CONSTRUCTION ZONE TRAFFIC CONTROL
335162, 335992, 342376, 347741

CONSTRUCTION ZONES
361371, 361363

CONSUMERS
318413, 337224, 346661, 349838, 361495, 361509, 361551, 361997

CONTACT
349491

CONTAINERS
348545

CONTAMINATION
361032

CONTINGENCY
335717, 361016, 361769

CONTINGENCY PLANNING
348750

CONTRAST
349889

CONTROL SYSTEMS
349260

CONVENIENCE
346755, 346756

CONVERSION
361491

CONVOYS
349652
COOPERATION
349275
COORDINATION
349275
CORNERING /VEHICLE/
346698
CORRELATIONS
342083, 349261
CORROSION RESISTANCE
362013
COST ACCOUNTING
343728
COST ANALYSIS
318413, 343714, 349193, 362012
COST COMPARISONS
349849, 361305, 361373, 361374
COST DATA
361299
COST EFFECTIVENESS
349839, 349840, 349891, 361044, 349882, 361492, 361769, 361606
COSTS
343714, 349660, 349656, 361027, 361040, 361307, 361306, 361177, 361181, 361385, 361496, 361600, 361997, 362013, 361920, 361926
COUNTERMEASURES
318981, 345067, 345064, 346125, 346122, 346121, 348355, 346124, 346123, 349492, 348751, 349110, 348748, 348957, 349844, 349876, 361039, 361038, 361149, 361156, 349874, 361312, 361494, 361361, 361489, 361762, 361569, 361568, 361907, 361566, 361916, 361996, 361922
COUNTIES
362015
COURTS
197709, 361379
CRANES
361017
CRASHWORTHINESS
341009, 345699, 348776, 361594, 361606, 361999
CRIME
361304, 361771
CRITERIA
349110
CROSSINGS
349644
CROSSWALK
341441
CRUSHING
342083
CURRICULUM
326369, 344438, 346164, 346163
CUSTOMS
361763
CYCLES
361362
CYCLIST
349328, 349329
CYLINDERS
349826, 361775

D

DAILY VARIATIONS
361039, 361038
DAMAGE
343667, 345063, 346118, 346117, 349269, 361995
DASHBOARDS
345021
DATA
349656, 361150, 361149, 361757, 361608
DATA ACQUISITION
335739, 342142, 346067, 346068, 348943, 349495, 349454, 349657, 361313, 361763, 361913, 362004, 362003
DATA ANALYSIS
309861, 344111, 344598, 346142, 346755, 346144, 346146, 348128, 346756, 346143, 348770, 349039, 349828, 349829, 349657, 349823, 361033, 361367, 361493, 361368, 361763, 361774, 361990, 362003, 361995
DATA BASE
346756, 347884, 346755, 348354, 349823, 361771, 361989, 361941, 361991
DATA MANAGEMENT
347884
DATA PROCESSING
344512, 361771, 362015
DATA RECORDING
349495
DATA REDUCTION
346067, 346068
DATA SAMPLING
362004
DATA SYSTEMS
342142, 361760
DAY
335161, 341402, 348022, 349193, 349652
DAYLIGHT
335157, 334826, 334829, 343714, 361318
DEACTIVATION
349640
DEATH RATE
348569
DECELERATION
361387
DECENTRALIZATION
346191, 346190
DECISION MAKING
329640, 345068, 348754, 349110, 349492, 349884, 349886, 361509
DEFECTS
349190, 349191, 361308, 361558
DEFENSIVE DRIVING
349641, 361779
DEFERRED MAINTENANCE
361327
DEFINITION
342083
DEFLECTION
361160, 361161
DEFORMATION
343667, 346118, 349038, 361499, 361776
DEGREES OF FREEDOM
318911, 318905
DEICERS
361327
DELAY TIME
361940
DEMAND
329043, 337224, 346161, 348758
DEMOGRAPHIC INFORMATION
334834, 348729, 348755
DEMOGRAPHIC STUDIES
346122
DEMONSTRATION PROJECT
314063, 344505, 344437, 346199, 361567, 361571
DEPTH
349818
DEREGULATION
361358, 361764
DESIGN
344609, 346191, 348762, 348841, 361324, 361562, 361561, 361775, 361594, 361563
DESIGN CRITERIA
341403, 345700, 347884, 349847
DESIGN SPEED
341403
DESIGN STANDARDS
345699
DETECTION
335158, 361486
DETECTORS
341402
DETERRENTS
361039, 361038
DEVELOPING COUNTRIES
345699, 348748, 349860, 361938
DEVELOPMENT
361561, 361562
DIAGNOSIS
335739, 361309
DIAGONAL BRAKE SYSTEM
361172
DIESEL ENGINES
344526, 349861, 361306, 361549, 361553, 361554, 361491, 361372, 361560, 361775, 362008
DIESEL FUELS
349828, 349660, 361372

DIFFERENTIAL EQUATIONS
349825
DIGITAL TECHNIQUES
318905, 318911, 349648, 361157
DIRECTIONAL RESPONSE
361772
DIRECTIONAL SIGN
349883
DISABILITY
361485
DISABLING INJURY
341634
DISASTER PREPAREDNESS
346754, 346765
DISPLACEMENT
345654
DISPLAYING
361043
DISPLAYS
342376, 342113
DISTANCE
344623
DOCKET
361558
DOOR LATCHES
345699
DOPPLER SYSTEM
361492
DOWNGRADE
349821, 361589
DRAG
344526, 347899, 349848, 349847
DRAG FORCE
349847
DRINKING DRIVER
318981, 197709, 331446, 329640, 197699, 334834, 344505, 346033, 346121, 346122, 346123, 346109, 346125, 348752, 349844, 349651, 349856, 349858, 349816, 349823, 349527, 349650, 361059, 349866, 361028, 361038, 361039, 349868, 349870, 361175, 361326, 361365, 361369, 361379, 361508, 361915, 361907, 361602, 361755, 361751, 361779, 361914, 362000, 361998, 361933, 361931, 361937
DRIVEABILITY
361506, 361487
DRIVER AGE
348129, 348727, 349253, 349255, 348914, 349858, 349827, 349651, 349870, 349889, 361026, 361041, 361173, 361175, 361174, 361512, 361759, 361614, 361933, 361930, 362015
DRIVER BEHAVIOR
334829, 335159, 329640, 335739, 341109, 330780, 341441, 345178, 345180, 341403, 347921, 349658, 349645, 349659, 349646, 361036, 349860, 349917, 349876, 361173, 361482, 361944
DRIVER CHARACTERISTICS
349261, 349816, 349868, 361031, 349866, 361175, 361482, 362015, 361932
DRIVER CLINIC
361033
DRIVER EDUCATION
361033, 361035, 361502, 361566, 361938
DRIVER EXAMINER
361559
DRIVER FATIGUE
345059, 348944, 349821, 361609, 361768
DRIVER HEARING
361035
DRIVER IMPROVEMENT
335739, 361033, 361031, 361175, 361559, 361486, 361570, 361569, 362015
DRIVER INFORMATION
361036, 361175, 361944
DRIVER INFORMATION SYSTEMS
335156
DRIVER INTERVIEW
349261
DRIVER LICENSE
346134, 348727, 348746, 362015
DRIVER LICENSE RENEWAL
349253, 361559
DRIVER LICENSE STANDARDS
349192, 361603
DRIVER LICENSE SUSPENSION
335739, 361751, 361916, 361907
DRIVER LICENSING
345700, 349192, 349260, 349662, 349834, 361026, 361175, 361559, 361555, 361550, 361614, 361919, 361566, 361569, 361759, 361570, 362000
DRIVER PERCEPTION
335155, 341108, 345178, 349649, 349646, 361030, 361036, 361485, 361486
DRIVER PERFORMANCE
330774, 329640, 345059, 348943, 348944, 349652, 349649, 349854, 349645, 361033, 361182, 361555, 361375, 361497, 361485, 361761, 361916, 361758
DRIVER PERFORMANCE CRITERIA
361609
DRIVER PSYCHOLOGY
349650, 361033, 361173, 361482
DRIVER REACTION
341109, 335162, 345178, 345021, 342376, 345179, 349837, 349649, 349877
DRIVER RECORDS
346134, 361033, 361031
DRIVER RESTRICTION
361041
DRIVER SEX
349856, 349858
DRIVER TEST
361603
DRIVER TRAINING
330774, 344438, 348727, 348915, 349641, 361035, 361027, 361175, 361182, 361497, 361504, 361595, 361614, 361603, 362000
DRIVER TRAINING WITH SIMULATORS
361035
DRIVER VISION
329640, 335160, 349873, 361483, 361779
DRIVERS /VEHICLE/
318981, 318911, 318905, 329640, 330774, 341403, 335914, 345062, 348355, 349834, 349843, 349889, 361486, 361494, 361918, 362006
DRIVING
349641, 361916, 362001
DRIVING CONDITIONS
361779
DRIVING HABITS
361031, 361553, 361779
DRIVING INSTRUCTOR
361603
DRIVING SIMULATORS
361035, 349877
DRIVING UNDER THE INFLUENCE
334834, 345059, 344505, 346686, 348944, 348943, 349844, 349875, 349880, 349873, 361379, 361907, 361751, 361920, 361601
DRIVING WITHOUT A LICENSE
361931
DRUGS
318981, 346125, 346122, 346121, 348943, 348944, 349880, 361059, 361369, 361915, 361916, 362000, 362001
DRUM BRAKES
349863
DRUMS
335162
DUAL HIGHWAYS
330775
DUMMIES
345654, 346680, 346170, 349497, 361155, 361158, 361159, 361166, 361167, 361164, 361163, 361165, 361990
DYNAMIC CHARACTERISTICS
361776
DYNAMIC RESPONSE
346067, 346068, 349825, 349877
DYNAMIC TESTS
361563, 361562

E

EARNINGS
361353
ECONOMIC CONSIDERATIONS
345207
ECONOMIC FACTORS
342142, 361309
ECONOMIC FORECASTING
329043
ECONOMIC IMPACT
349656, 361921, 361931, 361933, 361932, 361941, 361930
ECONOMICS
349865, 361310, 361764

EDUCATION
348767, 361572, 361567, 361928
EDUCATORS
361572
EFFECTIVENESS
197709, 335421, 342376, 344258, 344439, 346018, 344505, 346661, 347920, 347921, 347741, 348756, 349442, 348761, 348760, 349255, 349492, 349110, 348762, 349260, 349257, 349844, 349642, 349832, 361148, 349879, 349878, 349885, 361326, 361322, 361168, 361317, 361373, 361481, 361374, 361601, 361907, 361765
EFFICIENCY
345062, 348750, 349848, 361040, 361310, 361597
EJECTION
342083, 349194
ELASTIC PROPERTIES
362007
ELASTOMERS
361357, 361356
ELDERLY
334866, 345207, 348944, 361607
ELDERLY DRIVERS
348944, 349662
ELECTRIC DRIVES
361503
ELECTRIC VEHICLES
349037, 361594
ELECTRICAL EQUIPMENT
362013
ELECTRONIC CONTROL
362008
ELECTRONIC DEVICES
362008
ELECTRONIC FUEL INJECTION
361306
ELECTRONIC TRAFFIC DEVICES
361314
ELECTRONICS
361029, 361562, 361561, 361565, 361563, 361594, 362008
EMERGENCY
346754, 349839, 361301, 361300, 364847
EMERGENCY EGRESS SYSTEMS
361561
EMERGENCY MEDICAL TECHNICIANS
361593, 361572, 361567
EMERGENCY SERVICES
348915, 361556, 361569, 361567, 361571, 361570, 361572, 361992
EMERGENCY VEHICLES
344258, 361317, 361300, 361301, 361571
EMISSION CONTROL
349653, 361305, 361374, 361372, 361373
EMISSION RATES
361372
EMISSIONS
346189, 349497, 349643, 361306, 361594
EMPLOYMENT
361353
ENERGY
348750, 348753, 349497, 361310
ENERGY ABSORBERS
361370
ENERGY ABSORBING BUMPERS
361370
ENERGY ABSORPTION
345699, 348777, 361370, 361594
ENERGY CONSERVATION
335717, 343714, 349494, 361323, 361554, 361551, 361552, 361495, 361553, 361769, 362011
ENERGY CRISIS
348750, 361607
ENERGY USE
361554
ENFORCEMENT
335421, 347897
ENGINE CAPACITY
349856, 349851, 349857, 361174, 361503, 361504
ENGINE DESIGN
361563, 361561, 361562, 362013
ENGINE TUNE-UP
361944
ENGINEERING
349648
ENGINES
348914
ENTROPY
345868
ENVIRONMENT
349278, 361483
ENVIRONMENTAL EFFECTS
349876, 361932, 361933, 361930
ENVIRONMENTAL IMPACT
349037, 361560
ENVIRONMENTAL POLICY ACT
349838
EPIDEMIOLOGY
348729, 362003, 361938
EQUATIONS
345061, 348129, 349261, 364878
EQUILIBRIUM
345868
EQUIPMENT
346191, 349490, 362005
ERGONOMICS
329640, 345207
ESTIMATES
349656, 349838, 361312
ESTIMATING
349829, 361313, 361383
ETCHING
346191, 346190
ETHYLALCOHOL
344445, 349881
EVACUATION
349833
EVALUATION
331215, 335914, 314063, 318905, 318911, 335739, 335740, 341465, 346187, 346188, 348745, 349885, 361182, 361614, 361992
EXHAUST EMISSION CONTROL
361491
EXHAUST EMISSIONS
349828, 361037, 361487, 361552, 361560
EXHAUST SYSTEMS
349831, 362010, 361941, 361934
EXPENDITURES
337224, 348759
EXPERIENCE
349278, 348914
EXPERIMENTAL DESIGN
361037, 361176
EXPERIMENTAL SAFETY VEHICLES
342113, 349497, 361564
EXPERIMENTS
349831, 361776, 361995
EXPORTS
349817, 349869
EXPOSURE
349879
EXPRESSWAYS
348746
EYE FIXATIONS
349645
EYE MOVEMENTS
345062, 349645

F

FACE
361159
FACILITIES
346187, 346189, 346190, 346188, 346191
FAIL SAFE
349640
FAILURE
361308
FARM TRACTOR
361362
FAST FOOD STORES
361773
FATAL ACCIDENT REPORTING SYSTEM
362006
FATAL ACCIDENTS
331743, 345060, 345063, 345484, 345700, 341634, 344111, 348364, 348728, 348356, 346111, 349256, 349261, 349036, 349137, 349823,

361002, 361321, 361493, 361615, 361912, 361926, 361938, 361931, 361933, 361932, 362006, 361930
FATALITIES
330775, 197699, 344609, 344598, 341523, 348746, 348751, 346756, 348744, 348752, 346755, 348753, 348764, 349527, 349193, 348760, 349832, 349813, 349654, 349856, 349647, 349854, 349814, 349858, 349653, 361146, 361041, 349871, 349916, 349866, 349868, 361363, 361172, 361364, 361361, 361362, 361316, 361180, 361375, 361505, 361494, 361377, 361911, 361589, 361757, 361759, 361591, 361922, 361760, 361602, 362006, 362011, 362002, 361931, 362015
FATIGUE
329640, 348943
FEASIBILITY
343728, 346164, 348022, 346163
FEASIBILITY STUDIES
343714
FEDERAL AID
348752, 361922, 361754, 361610, 361992
FEDERAL BUDGETS
348753
FEDERAL GOVERNMENT
348545, 362011
FEDERAL HIGHWAY ADMINISTRATOR
349846, 361323
FEDERAL MOTOR VEHICLE FLEET REPORTS
361299
FEDERAL PROGRAMS
318413, 132132, 349494, 349846, 361359, 361358, 361502, 361556, 361567, 361588, 361917, 364847
FEEDBACK
349648
FEEDER BUSES
361604
FEMALE DRIVERS
349527
FIELD DATA
361313
FIELD MEASUREMENTS
344623
FIELD OBSERVATION
349658, 349659
FIELD OF VIEW
361305
FIELD STUDIES
342376, 349645, 361168, 361481
FIELD TESTS
335159, 346698, 346699, 349877
FILLET WELDS
361371
FINANCING
348750, 346196, 346670, 349275
FINES /PENALTIES/
361920
FINITE ELEMENT METHOD
349867, 361499, 362013
FIRE
346018, 349833, 361364, 361592, 361612
FIRE RESISTANCE
349833, 361179
FIRES
345063, 347884
FIXED BASE
341009
FIXED OBJECT
361044
FLAMMABILITY
344504
FLASHING SIGN
347741
FLEETS
346142, 361299
FLOATS
349643
FLUORESCENCE
335159, 335157, 334826, 345180
FLYING CARS
361176
FOG
334829, 341402, 361364
FOLLOWING DISTANCE /OF VEHICLES/
349652, 349659, 349843, 349658, 361483, 361768
FOOD
349881
FORCES
361158, 361161, 361160
FORECASTING
329640, 348728
FORECASTS
342142, 349660, 361568, 361991
FOREIGN COUNTRIES
331215, 345060, 349832
FOREIGN TRADE
349817, 361360
FOREIGN VEHICLES
349490, 349862, 361360, 361552, 361616, 362005
FORMATS
349262
FOUR DOOR CARS
349824, 349827, 349820
FOUR DOOR VEHICLES
349851, 361298
FOUR WHEEL DRIVE
361302
FOURIER TRANSFORMS
361304
FRAUD
361325, 361550
FREEWAY SIGNS
342376
FREEWAYS
349659, 349658, 349917
FREIGHT TRANSPORTATION
335421, 348545, 347897, 348915
FREQUENCY
344598
FREQUENCY DISTRIBUTION
361512
FRICTION
349491, 349815, 361753
FRICTION TESTS
361776
FRONT WHEEL DRIVE
361597, 362013
FRONTAL COLLISIONS
342113, 343713, 344111, 343716, 343681, 361149, 361159, 361169, 361606
FUEL AIR MIXTURES
342113, 349826
FUEL CELLS
349845
FUEL CONSUMPTION
329043, 342113, 343714, 343739, 344506, 344526, 343728, 344416, 348749, 346189, 347899, 346661, 346713, 346175, 349037, 348957, 349643, 349494, 349660, 349843, 349848, 349847, 349653, 361040, 361356, 361310, 361323, 361302, 361554, 361551, 361495, 361383, 361553, 361552, 361487, 361491, 361506, 361384, 361564, 361763, 361597, 364878, 361944, 364879, 362008, 364880
FUEL ECONOMY URBAN CYCLE TEST PROCEDURE
361506
FUEL EFFICIENCY
361553
FUEL ELEMENTS
349855
FUEL INJECTION
361306
FUEL PUMPS
349821
FUEL SHORTAGE
335717, 348750
FUEL SPECIFICATIONS
361929
FUEL STORAGE
341463, 344506
FUEL SYSTEMS
346018, 361592
FUEL TANKS
361592
FUELS
341463, 345063, 349845, 349826, 361506, 361594
FUND ALLOCATIONS
361556, 361754, 361944, 361992
FUTURE CONCEPTS
361315

G

GAGES
349818, 361043
GAGING
361032
GAMMA RAYS
361032
GAP ACCEPTANCE
348943
GARAGES
349833, 349827
GAS FLOW
361488
GASOHOL
361310
GASOLINE
349855, 349660, 361032
GASOLINE DRIVES
361503
GASOLINE ENGINES
361491
GEARS
344416, 349034
GEOMETRIC DESIGN
361166
GLARE
349889
GLOSSARIES
361590
GRAPHIC METHODS
361035
GRAVITY MODEL
345868
GROOVES
349818
GROSS VEHICLE WEIGHT
347899, 349032, 349916
GROUP BEHAVIOR
361595
GROUP RIDING
361595
GUARDRAILS
331278, 348355, 361044, 361363
GUIDANCE SYSTEMS
361311
GUIDE SIGNS
349646, 361481
GUIDELINES
331278, 344258, 346181, 346196, 346765, 361182, 361556, 361553, 361778, 361777, 361591, 361996
GUIDES
361558
GUIDEWAYS
361327

H

HALO EFFECT
361181
HAND SIGNALS
361595
HANDBOOKS
346765
HANDICAPPED INDIVIDUALS
345207, 346755, 346144, 346145, 346143, 346146, 346756, 348756, 348943, 348776, 349662, 349854, 361311, 361607, 361990, 361989
HANDLING
318911, 318905, 325077, 349853, 349648, 349850, 361563, 361564
HARDWARE
349184
HAZARDOUS MATERIALS
335421, 347897, 346754, 348545, 346765, 348915, 349839, 361760, 361588, 361992, 364847
HAZARDS
349887, 362001
HEAD
341634, 345484, 349642, 361148, 361153, 361045, 361152
HEAD INJURY CRITERION
361564
HEAD ON COLLISIONS
361170
HEAD RESTRAINTS
345699
HEADLIGHT GLARE
349873
HEADLIGHTS
334829, 334826, 335159, 345021, 345180, 343714, 349857, 361324
HEADWAY
349652, 349658, 349659, 349917
HEALTH
334866, 346109, 348729, 348569, 349834
HEARING LOSS
349662, 361035
HEARINGS
314063
HEAT FLUX
361488
HEAT RESISTANCE
361037
HEAVY DUTY TRUCKS
361554, 362006, 362008
HEAVY EQUIPMENT
361325
HEAVY VEHICLES
337892, 337893, 344609, 346170, 349839, 349831, 361026, 361002, 361484, 361613, 361913, 361993, 361994, 364878, 364879, 364880
HEIGHT
349837
HELICOPTERS
361571
HELMETS
331446, 345700, 341634, 349642, 349255, 349857, 349814, 349813, 361153, 361148, 361505, 361566, 361928, 361593, 361909, 361603, 362000
HIGH ACCIDENT LOCATIONS
349891, 361382
HIGH BEAMED HEADLIGHTS
361779
HIGH RISK DRIVERS
361031
HIGH SCHOOLS
335718, 348727, 346164
HIGH SPEED
349822, 361602, 361589
HIGH SPEED PHOTOGRAPHY
345654
HIGH STRENGTH STEELS
342113
HIGHWAY BEAUTIFICATION
361314
HIGHWAY CLASSIFICATION
348357
HIGHWAY CONSTRUCTION
335992, 361323
HIGHWAY CURVES
341403
HIGHWAY DESIGN
348356, 348357, 361323, 361494
HIGHWAY ENGINEERING
349184
HIGHWAY IMPROVEMENTS
348355, 348356, 349891
HIGHWAY LIGHTING
341009, 348357
HIGHWAY MAINTENANCE
347741, 348752, 361323
HIGHWAY PLANNING
361323
HIGHWAY RESEARCH
345061, 361016
HIGHWAY SAFETY
318981, 326369, 331278, 330775, 335154, 335155, 132132, 335157, 335156, 342142, 344439, 346122, 346033, 344445, 346121, 346109, 344443, 348754, 346125, 348356, 348751, 346124, 346123, 348355, 349493, 349110, 348943, 349843, 349835, 349846, 361016, 349885, 349891, 361044, 349882, 361388, 361927, 361608, 361610, 361917, 361944
HIGHWAY SAFETY ACT
361754
HIGHWAY SIGNS
349646
HIGHWAY TRANSPORTATION
341523

HISTORY
361147
HIT AND RUN ACCIDENT
361304
HOLIDAY
349870, 361362
HOLOGRAPHY
349861
HOMICIDE
361316
HORIZONTAL ALIGNMENT
349821
HORNS
345021
HOSPITALS
361380, 361774
HOUSEHOLDS
361495
HUMAN ENGINEERING
361369
HUMAN FACTORS
335163, 335156, 335160, 318981, 345021, 345059, 346162, 348423, 349842, 349835, 361324, 361369, 361779
HYBRID VEHICLES
349037, 361554, 361594
HYDRAULIC BRAKE BOOSTERS
361354
HYDRAULIC BRAKES
361354
HYDRIDES
341463
HYDROGEN
341463, 349845
HYDROMECHANICS
349034
HYDROPLANING
361910
HYPOTHESES
361753
HYSTERESIS
361160

I

IDENTIFICATION
341108, 348128, 361359, 361486, 361500
IDENTIFYING NUMBER
361307, 361500
IGNITION
349826
IGNITION SYSTEMS
361767
IMPACT
361495
IMPACT ATTENUATION
361041, 361370
IMPACT ATTENUATORS
361172
IMPACT STUDIES
335739, 335914, 343714, 346111, 343681, 343713, 345060, 349253, 349255, 349110, 349508
IMPACT TESTS
331278, 341009, 345654, 346117, 344512, 346118, 344504, 343716, 346170, 361028, 361165, 361162, 361160, 361562, 361565, 361566, 361564, 361563, 361561, 361990
IMPLEMENTATION
348750, 346134, 361386, 361380, 361381, 361494
IMPLIED CONSENT
349875, 361915, 362015
IMPORTS
349869, 361756
IMPROVEMENT
335421, 318905, 318911, 345180, 347884, 349495, 361481, 361610
INCENTIVES
346661, 346175, 361323, 361928
INCOME
361385
INCREASE
348751, 348728
INDEXES
346713, 361999
INERTIA
349825, 361913
INFANTS
348756, 348755, 348772, 349496, 349655, 361381, 361380
INFLATABLE DEVICES
361562, 361563
INFLATION
361499
INFLATION LOADING
361499
INFORMATION
349656
INFORMATION CONTENT
349646, 349644
INFORMATION DISSEMINATION
335154, 344445, 344440, 346109, 349492, 349184, 349496, 361495, 361928
INFORMATION SYSTEMS
361325
INJECTION MOLDING
361910
INJURIES
341634, 342083, 319845, 309861, 197699, 330775, 331215, 341439, 331743, 345484, 345699, 346111, 344609, 344598, 344504, 343716, 345063, 348751, 346755, 346756, 348744, 348760, 349527, 349256, 349036, 349508, 349328, 348764, 348778, 349194, 348761, 349193, 349038, 349642, 349647, 348763, 349269, 349653, 349827, 349813, 349832, 349842, 349854, 349871, 361153, 361002, 361165, 361156, 361148, 349887, 361146, 361162, 361155, 361154, 361149, 361152, 361161, 361150, 361164, 361159, 361157, 361151, 349890, 361298, 361180, 361363, 361362, 361312, 361171, 361167, 361170, 361168, 361178, 361169, 361369, 361367, 361174, 361364, 361172, 361361, 361494, 361375, 361563, 361377, 361493, 361589, 361565, 361387, 361566, 361922, 361591, 361593, 361911, 361602, 361760, 361932, 361774, 361939, 362002, 361993
INNOVATION
349864, 361366
INSPECTION
346698, 346699, 361363
INSPECTION PROCEDURE
361778, 361777, 362010
INSPECTORS
346188
INSTALLING
361177
INSTRUMENT PANEL
345699, 361043
INSTRUMENTATION
346067, 346068, 361548
INSURANCE
349827, 349820, 349851, 349824, 361367, 361358, 361368, 361307, 361298, 361325, 361178, 361174, 361501, 361608
INTENSITY
335161
INTERCHANGES
361592
INTERGOVERNMENTAL RELATIONS /U.S./
346109, 347897, 349184
INTERIOR
349887, 361179, 362013
INTERNAL COMBUSTION ENGINES
361775
INTERNATIONAL COMPACTS
349275
INTERNATIONAL ROADS
362000
INTERSECTION APPROACH
349641
INTERSECTION CAPACITY
348957
INTERSECTIONS
341441, 345064, 348128, 348933, 349641, 348957, 349829, 361944
INTERSTATE HIGHWAY SYSTEM
361944
INTERSTATE TRANSPORTATION
361493
INTERURBANS
345060
INTERVIEWS
335739, 349836, 361326, 361502, 361612
INVENTIONS
349864

INVESTIGATIONS
349884, 361308

J

JEEPS
361912
JERK CONTROL
361490
JOB ANALYSIS
361353
JOBS
361353

K

KINEMATICS
348777, 361169, 361387
KNOCK
361929
KNOWLEDGE
344422

L

LABELS
348545
LABORATORY STUDIES
361375
LABORATORY TESTS
341108, 346698, 346699, 346700, 349646, 349645, 349855, 361484
LAND USE
348129, 361773
LANE CHANGE
361364
LANE CLOSING
342376, 347741
LARGE RESEARCH SAFETY VEHICLE
361562, 361561, 361563
LASER APPLICATIONS
349818, 349861
LATERAL DYNAMICS
349825
LATERAL FORCES
349859
LATERAL MOVEMENT
345178
LAW ENFORCEMENT
341441, 314063, 348756, 348746, 348753, 348752, 348778, 348764, 348765, 348774, 348767, 348773, 348779, 348766, 349650, 349651, 349872, 349832, 361039, 361041, 361038, 361301, 361300, 361325, 361358, 361181, 361173, 361588, 361569, 361500, 361570, 361915, 361751, 361765, 361938, 362015, 361943
LAWS
341441, 335740, 331215, 335914, 345060, 345700, 346109, 346686, 348756, 346754, 348759, 348757, 348752, 348761, 348753, 346134, 349442, 348915, 349496, 349255, 349662, 349659, 349814, 349832, 349875, 349813, 349664, 361026, 361318, 361314, 361379, 361386, 361915, 361612, 361916, 361918, 361914, 361928, 361909, 361752
LEAD /METAL/
361032
LEASING
349822
LEAST SQUARES METHOD
361157
LEATHER
361507
LEG
341634, 361158, 361171
LEGAL ACTION
346033, 361359, 361375, 361909
LEGAL AGE
361937
LEGAL ASPECT
346123, 346122, 349830, 349872, 361026, 349886, 361389, 361765
LEGAL DRINKING AGE
361319, 361321, 361998
LEGAL RESPONSIBILITY
348764, 361918
LEGISLATION
361500, 361591, 361569, 361764, 361917
LEGISLATIVE SUPPORT
361379, 361909
LENGTH
364989
LIBRARIES
361558
LIFE SPAN
349862
LIFE TESTING
349862
LIFTS
346755, 346756
LIGHT DUTY VEHICLES
361560
LIGHT TRUCKS
337224, 329043, 343739, 347899, 346161, 349862, 361912, 362012, 362006
LIGHTING
361036
LIGHTING EQUIPMENT
361371
LIGHTS
341109
LIGHTWEIGHT MATERIALS
342113, 343728, 349848, 361357, 361356, 362012
LINE HAUL TRANSPORT
361553
LINE OF SIGHT
349877
LINK VOLUME
345868
LIQUEFIED GASES
341463
LIQUID HYDROGEN
341463
LIQUOR STORES
361773
LOAD DEFLECTION
361370
LOAD DISTRIBUTION
361158
LOAD FACTORS
361502
LOADS
325077
LOAN PROGRAM /CHILD RESTRAINTS/
361381, 361380
LOCAL GOVERNMENT
335717, 346109, 348750, 349184, 349874, 361921, 361610, 361769, 361916, 364847, 361996
LOCATING
348128
LOCATIONS
349194, 349038, 349816, 349871
LOCKED-WHEEL
364989
LOCOMOTIVE CAB DESIGN
348423
LONG TERM
349817
LOSSES
349851, 361368, 361367, 361501
LOW ALLOY STEELS
342113
LOW BEAMED HEADLIGHTS
361324
LOW COST
349891
LOW TEMPERATURES
349826, 361383
LOW VOLUME ROADS
361944
LUBRICANTS
344526, 344416
LUBRICATING OILS
348745

M

MAINTENANCE
349863, 361354, 361363, 361589, 361592, 361767, 362009
MAINTENANCE COSTS
337893, 337892, 346142, 349863
MAINTENANCE EQUIPMENT
361945

MAINTENANCE MANAGEMENT
349863, 361299
MAINTENANCE OPERATIONS
362010, 361945
MAINTENANCE PERSONNEL
349863, 361353
MALE DRIVERS
334834, 349527, 349917
MANAGEMENT
361299, 361616
MANAGEMENT SYSTEMS
361378
MANDATORY HELMET LAWS
361505
MANPOWER UTILIZATION
326369, 349888, 361181
MANUAL CONTROL
348756
MANUAL TRANSMISSION
362009
MANUALS
326369, 318905, 318911, 344447, 344443, 344258, 346765, 346754, 346164, 346163, 361313, 361557, 361555, 361380, 361550, 361381, 364879, 364878, 362004
MANUFACTURERS
346145
MANUFACTURING
349190, 349191, 361029, 361308, 361490, 361597, 362012
MARIHUANA
335718, 348729, 361375, 361758
MARKET RESEARCH
329043, 337224, 346161
MARKETING
346175, 346661
MARKETS
346713
MARKINGS
364989
MASS
349916
MASS MEDIA
335914
MASS TRANSIT
361771
MATERIALS
349849, 349865, 361554
MATERIALS EVALUATION
349867, 361357, 361356
MATERIALS TESTING
349867, 349849
MATHEMATICAL MODELS
318911, 318905, 346680, 346754, 346161, 349877, 349888, 362014
MATRIX
345868
MATURITY
349278
MEAN /STATISTICAL/
341402
MEASUREMENTS
341403, 343716, 346713, 349828
MEASURES OF EFFECTIVENESS
345062, 346188
MEASURING
345062, 361544, 361548, 361546, 361547, 361545, 364989
MEASURING INSTRUMENTS
349818, 361913
MECHANICAL ENGINEERING
349648
MECHANICAL EQUIPMENT
347732, 347733
MECHANICAL PROPERTIES
361179
MECHANICS
361353
MEDIAN BARRIERS
330775, 331278
MEDICAL ADVISORY BOARDS
361559
MEDICAL ASPECTS
348756, 348779, 348775, 348778, 361059, 361593
MEDICAL CONDITIONS
361918
MEDICAL DISABILITY
349662
MEDICAL EXAMINATION
349834
MEDICAL SERVICES
348758, 361572, 361569, 361571, 361570, 361567, 361556
MEDICINE
341439, 349880
MEDIUM TRUCKS
362006
MENTAL ILLNESS
349662, 361918
MENTAL STRESS
345059
MENTALLY RETARDED INDIVIDUALS
349662
METALLURGICAL ANALYSIS
361017
METHANE
341463
METHODS
349844, 349879, 361017, 361182
METRIC SYSTEM
361305
MICROCOMPUTERS
361609
MICROELECTRONICS
362013
MICROPROCESSOR
362008
MICROWAVES
344623
MILEAGE
348749, 361040, 361305, 362008
MINIBUSES
361604
MINICOMPUTERS
361490
MINIMUM AGE REQUIREMENTS
361603
MINORS
302437, 319845, 345067, 345070, 345075, 345068, 344438, 345065, 349879, 349887
MOBILITY
349037
MODAL SELECTION
345207, 349852
MODELS
302437, 345062, 345069, 348743, 349193, 348861, 349852, 361389
MONITORING
349260, 361365, 361609
MONOCULAR DRIVERS
361919
MOPED DRIVERS
361175
MOPEDS
348728, 361566, 361503
MOTION PICTURE FILM
345070, 345069
MOTIVATION
349655
MOTOR CARRIER ACT OF 1980
361764
MOTOR CARRIERS
348744, 361493, 361588, 361388, 361589, 361764
MOTOR HOMES
361362
MOTOR SCOOTERS
349869, 361504
MOTOR VEHICLE ACCIDENTS
341523, 330775, 331743, 349255, 349039, 349269, 349038, 361319, 361377, 361389
MOTOR VEHICLE LAWS & REGULATIONS
349885, 361557, 361997
MOTOR VEHICLES
331278, 329043, 318905, 318911, 318413, 337224, 346018, 346175, 349656, 349865, 361494, 361777
MOTORCYCLE DRIVERS
334826, 335159, 341634, 331446, 345700, 345180, 348914, 349329,

349642, 349255, 349841, 349857, 349814, 349856, 349873, 349813, 361002, 361148, 361175, 361502, 361593, 361595, 361555, 361504, 361505, 361909, 361936
MOTORCYCLE RIDERS
349841
MOTORCYCLES
334826, 344446, 345180, 344447, 348022, 348728, 348944, 349869, 349841, 349816, 361353, 361307, 361569, 361501, 361504, 361566, 361570, 361500, 361935, 361934, 361930, 361933, 361941, 362006
MOTORIZED BIKES
361503
MOUNTING
349837, 361324
MOVING VIOLATIONS
346033, 362015
MUFFLERS
349831, 361549
MULTIDISCIPLINARY ACCIDENT INVESTIGATIONS
361558
MULTIDISCIPLINARY TEAMS
349876
MULTIPLE CAR ACCIDENTS
349822, 361364
MULTIPLE OCCUPANCY VEHICLES
361323
MULTIPLE PURPOSE VEHICLES
361912
MULTIPLE REGRESSION
348129, 349829, 361316

N

NATIONAL ACCIDENT SAMPLING SYSTEM
362004
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
361502, 361558
NEAR MISS ACCIDENTS
361760
NECK
361151, 361148, 361149, 361150, 361593
NEIGHBORHOODS
349830
NETWORKS
345868
NEW SYSTEMS
361597
NIGHT
334829, 341109, 341402, 335161, 335160, 349261, 349152, 349652, 349878, 349889
NIGHT VISIBILITY
335159, 335158, 335156, 361324, 361995
NIGHT VISION
335163, 349873, 361324
NITRILE RUBBER
349643
NO PASSING ZONE
347921, 347920
NOISE /SOUND/
349861, 361037, 362009, 361941
NOISE CONTROL
349861, 361549, 361766, 361941
NOISE LEVELS
346189, 349032, 361303, 361489, 361934, 361941
NOISE POLLUTION
349861, 349831, 361941
NOISE-VIBRATION-HARSHNESS
361766
NON-REPEATERS
349650
NONDESTRUCTIVE TESTING
361032
NONLINEAR EQUATIONS
361303
NONLINEAR SYSTEMS
349819

O

OBJECTIVES
349495, 349653, 361182, 361378
OCCUPANT RESTRAINT
331215, 344440, 346016, 348763, 348766, 348768, 346755, 346756, 348760, 348761, 348757, 348767, 348759, 348769, 348756, 348765, 348762, 348764, 348755, 348758, 348752, 348777, 348772, 348776, 348779, 349493, 349497, 348770, 348778, 348771, 361041, 361158, 361164, 349885, 361149, 361174, 361564, 361562, 361563, 361561, 361932, 361917, 361779, 361928, 361930, 361990, 361989
OCCUPANTS
331278, 343681, 342083, 343713, 344609, 343716, 349036, 349916, 361371, 362006
OCTANE RATING
349855, 361929
OFF-PEAK
361607
OFF-THE-ROAD
349859, 361180
OIL FILM METHOD
361488
ON BOARD COMPUTERS
361565
ON LINE COMPUTERS
361037, 361600, 361609
OPEN CARGO AREAS
361591
OPERATING COSTS
318911, 318905, 361181, 361385
OPTICAL INSTRUMENTS
341402
OPTIMIZATION
344501, 361487
ORGANIZATIONS
346181, 346670
OUT OF STATE
361943
OVERTURNING
346019, 349839, 349815, 361589
OWNERS
361501
OWNERSHIP
349865
OZONE
361373, 361374

P

PADS
344504
PAINTING
361353
PANELS
335162, 349849
PANIC BRAKE APPLICATION
361364
PARKED VEHICLES
349644
PARKING DEMAND
361773
PARKING REGULATIONS
346124, 349872
PARTICULATES
344526, 361372
PARTS
349817, 361353, 361500
PASSENGER RESTRAINTS
346144, 346143, 345699, 346145, 346146, 361989
PASSENGERS
344438, 349852, 361041
PASSING
345178, 347920, 347921, 361768
PASSIVE PROTECTION DEVICES
348777, 361997
PASSIVE RESTRAINTS
348769, 346162, 348778, 348771, 349832, 361305
PATIENTS
361774
PATROL
361181
PAVED SHOULDERS
349882
PAVEMENT CONDITION
348357
PAVEMENT PERFORMANCE
349815
PAVEMENT SKIDDING CHARACTERISTICS
345061, 361753

PAYMENT
349820
PEDESTRIAN ACCIDENTS
335740, 343714, 345067, 348728, 349137, 349647, 349254, 349868, 349866, 349870, 349816, 349871, 361169, 361171, 361922, 361602, 362006, 361996
PEDESTRIAN CHARACTERISTICS
349860
PEDESTRIAN CROSSINGS
341441, 349860, 361611
PEDESTRIAN PROTECTION
335158, 348944, 348943, 349497, 361002, 364988
PEDESTRIAN SAFETY
335740, 346121, 346122, 346124, 346125, 346165, 346164, 346163, 348944, 349256, 361922, 364988, 361996
PEDESTRIAN VEHICLE CONFLICTS
349254, 361922
PEDESTRIANS
302437, 341441, 345070, 345067. 345068, 345075, 361364, 361311, 361562, 361563, 361565, 361933
PENALTIES
361920
PENETRATION
343667
PENETRATION RESISTANCE
345699
PERCEPTION
335718, 344422, 349278
PERFORMANCE
132132, 348747, 361355, 361491, 361503, 361935, 362010
PERFORMANCE EVALUATIONS
347884
PERFORMANCE TESTS
331278, 344446, 344447, 346699, 346700, 346698, 361037, 361040, 361042, 361487, 361564, 361910
PERIPHERAL VISION
335163, 361034
PERSONAL INJURY
349858, 349851, 349827, 361298, 361367
PERSONNEL MANAGEMENT
349888, 361378
PERSONNEL TRAINING
326369, 341439, 347897, 346188, 349657, 361027, 361550, 361496, 361992, 364847, 362003
PHARMACOLOGY
348729
PHOTOGRAPHS
346680, 349152, 349269
PHYSICAL FACTORS
349662, 361303
PHYSICAL FITNESS
361026, 361918
PHYSICIANS
361918
PHYSIOLOGICAL ASPECTS
361483
PHYSIOLOGICAL EFFECTS
349881, 361761
PICKUPS
343681, 361367. 361368, 361591
PICTOGRAMS
361043
PIPELINES
341523
PISTONS
361488
PLACEMENT
361177
PLANNING
361381, 361380, 361568, 361922. 361991, 364847
PLASTIC MATERIALS
348747, 349867, 361594
PLASTICS
361356, 361562, 361563
PLATOONING
341402
POINT SYSTEM
361031
POISSONS DISTRIBUTION
361016
POLES
341009, 345484, 349036
POLICE
335914, 330774, 345063, 346686, 348354, 361027, 349888, 361301, 361379, 361300, 361365, 361926, 361765, 361943
POLICE PATROLLING
349888, 361382
POLICY
344443, 361358, 361937
POLITICS
346122, 361358
POLYURETHANE
342113, 361357, 361356, 361910
POPULATION GROWTH
348728
POSITION /LOCATION/
361154
POWER BRAKES
325077
POWER PLANTS
349037, 361594
POWER SPECTRAL ANALYSIS
361510
POWER STEERING
325077, 349853, 361354
POWERTRAINS
361554
PRECOMBUSTION DIESEL ENGINES
361488
PREDICTIONS
341403, 345061, 345064, 348861, 361157, 361316, 361609, 361936
PREFERENCE
337224
PREVENTION
318413, 345700, 344504, 345699, 349647, 349328, 361369
PREVENTIVE MAINTENANCE
361779
PRICES
349653, 361310, 361495
PRIORITIES
348356, 349891
PRIVATE ENTERFRISE
361607
PROBABILITY DISTRIBUTIONS
349916, 361511, 361993
PROBATION
344505, 349262
PROBING
349261
PROBLEM DRIVER
349260, 349262
PROBLEM SOLVING
361496
PROCESSING
361357, 361763
PRODUCTION
349865, 349869
PRODUCTIVITY
337892, 337893, 361616
PROFESSIONAL PERSONNEL
349834
PROFITS
361509, 361756
PROGRAMMING
345868
PROGRAMS
349655, 349492, 361373, 361378, 361374, 361922, 361610, 361996
PROJECT PLANNING
346191, 346190, 349275
PROJECTIONS
361560
PROPERTY DAMAGE
348744, 349858, 349868, 361312, 361493, 361760
PROPOSALS
361026
PROSECUTION
361916
PROTECTION
344438, 349328, 361501, 361500
PROTECTIVE EQUIPMENT
349642, 348776, 361505

PSYCHOLOGICAL ASPECTS
329640, 349835, 349657
PSYCHOLOGICAL EFFECTS
348569, 361303
PSYCHOMOTOR PERFORMANCE
349649, 361758
PSYCHOMOTOR STRESS
329640
PSYCHOTROPIC AGENTS
362001
PUBLIC
361039, 361038, 361379
PUBLIC HEALTH
348771, 361059, 361598, 362001
PUBLIC INTEREST
348754
PUBLIC OPINION
346121, 346124, 346123, 346122, 344506, 346125, 344422, 348753, 361386
PUBLIC POLICY
348775, 349496
PUBLIC SERVICE VEHICLES
349833
PUBLIC TRANSIT
335717, 334866, 346144, 346146, 346143, 362002
PUBLICITY
335914, 349832, 361376, 361917
PURCHASING
361028
PURSUIT
361300, 361301

Q

QUALITY
361040, 361992
QUALITY CONTROL
346188, 361029, 361616
QUESTIONNAIRES
197709, 349832, 361326, 361603, 361911
QUEUES
361763

R

RACK AND PINION STEERING
349853
RADAR
349329, 361492, 361599, 361765, 361923
RADAR APPLICATIONS
361765
RADAR EQUIPMENT
344623, 361181, 361765
RADAR VEHICLE DETECTOR
361181, 361765
RADIAL TIRES
346698, 361355, 361356, 361499, 361776, 362007
RADIATION HAZARDS
344623
RADIO
361944
RAIL TRANSPORTATION
341523
RAILROAD/HIGHWAY GRADE CROSSINGS
361760
RAINFALL
345061
RAISED PAVEMENTS
361611
RAMPS
346755, 346756
RATES /COSTS/
361764
RATING
348355, 361503, 361505, 361999
REACTION TIME
341108, 345021, 345179, 349837
REAL-TIME SYSTEMS
361600
REAR END COLLISIONS
349152, 361180, 361592, 361993
REAR LIGHTS
361483
REAR VIEW MIRRORS
343714
REAR WHEEL DRIVE
361309
REBUILDING
361309
RECALL
349490, 349190, 349191, 361558, 362005
RECESSION
349817
RECIDIVISM
197709, 361907
RECKLESS DRIVERS
361173
RECKLESS DRIVING
346033
RECOGNITION
345062
RECOMMENDATIONS
344439, 346181, 346670, 349328, 349495, 361914, 361757
RECORDS MANAGEMENT
361771
RECORDS STORAGE
348354
RECOVERY
349839
RECREATION
361921
RECREATIONAL VEHICLE
329043, 337224, 361362
REDIRECTION
335992
REDUCED VISIBILITY
341402
REDUCTION
346111, 348760, 349032, 349654, 349832, 349831, 361168, 361169, 361148, 361318, 361383, 361321, 361914
REFERENCE FUELS
361929
REFERENCE MATERIALS
361558
REFERENCE SYSTEMS
361558
REFLECTORS
335163
REGIONAL GOVERNMENT
349492, 361921, 361996
REGISTRATIONS
349869, 349865, 349664
REGRESSION
349261
REGRESSION ANALYSIS
346018, 349819, 361031, 361512, 361508, 361511, 361942, 364989
REGULATIONS
335421, 347897, 348774, 348022, 349653, 348915, 349656, 349654, 349838, 349878, 349884, 361305, 361361, 361603, 361588, 361941
REHABILITATION
197709, 197699, 344505, 346109, 348758, 349650, 349262, 361326, 361601
REID VAPOR PRESSURE
361506
RELIABILITY
349836, 361765
REMEDIAL AIDS
361485, 361942
REMEDIES
349881
REPAIR COSTS
361551
REPAIR SHOPS
361498
REPAIRING
361299, 361309
REPAIRS
361354, 361498, 362009
REPEATERS
349650, 361036
REPLACEMENTS
361299
REPORTING
361918

REQUIREMENTS
346191, 361355
RESEARCH
341439, 345068, 345067, 345069, 345070, 349275, 349496, 349844, 349830, 349832, 361558, 361495, 361608, 361613, 361999
RESEARCH AND DEVELOPMENT
344526, 347884, 361315, 364988
RESEARCH SAFETY VEHICLE
346019, 349497, 361564, 361565, 361563, 361561, 361562
RESIDENTIAL AREAS
348129, 349830
RESISTANCE
344526, 347899, 361910
RESPONSE
343713, 343716
RESPONSE TIME
349646, 349883, 361571, 361567, 361995
RESPONSIBILITIES
361379, 361378, 361751
RESTRICTIONS
348914
RETARDERS
337892, 337893
RETRAINING
361485
RETRO-REFLECTORS
335159, 335158
RETROFITTING
345060
REVIEWS
344526, 344439, 348729, 349256, 348933, 349844
RIDE SHARING
335717, 361323
RIGHT ANGLE COLLISIONS
349152
RIGHT ANGLE INTERSECTION
348841, 349829
RIGHT TURN
348957
RIGHT TURN ON RED
361384
RIGHT-OF-WAY
349641
RIGIDITY
345700
RIMS
361507, 361766
RISK
335740, 329640, 318981, 346021, 346765, 347897, 349659, 349658, 349527, 349652, 349878, 349886, 361169, 349917, 361149, 361168, 361316, 361598, 361916, 361915, 361914, 361993
RISK MANAGEMENT
361927, 361926
ROAD GRADES
348357
ROAD INVENTORY
361932
ROAD SURFACES
348357, 361932
ROADSIDE
331278, 348129, 361365, 361388, 361327
ROADSIDE ADVERTISING
361314
ROLLING
344526, 347899, 361910
ROLLOVER ACCIDENTS
318413, 342083, 346170, 349194, 361912, 361612
ROOF SUPPORTS
349194
ROOFS
342083
ROTATION
343667
ROUGHNESS
361766
ROUTE GUIDANCE
361481
RUBBER
349491, 361304, 361507, 361776
RUBBER TIRES
361776
RUNAWAY VEHICLES
337893, 337892, 349822
RUNNING LIGHTS
334826, 349193, 361318
RURAL AREAS
330780, 346163, 346164, 346765, 346165, 349256, 349888, 361377, 361556, 361607
RURAL HIGHWAYS
330775, 341403, 348129, 347920, 347741, 347921, 348918, 349882, 349891

S

SAFETY
335421, 346018, 346700, 346756, 346755, 348364, 347884, 349642, 349654, 349653, 349490, 349839, 349840, 361147, 361028, 361361, 361551, 361594, 361599, 361771, 361995, 361999, 364847, 362005, 361997
SAFETY BELTS
331446, 335914, 343716, 309861, 346109, 345699, 345484, 346162, 346016, 345060, 348762, 348761, 348766, 346680, 348752, 348769, 348756, 348758, 348763, 348767, 348765, 348768, 348770, 346755, 348757, 346756, 349496, 349442, 349508, 349655, 349255, 349328, 349659, 349832, 349842, 361167, 361045, 361028, 361059, 361168, 361159, 349917, 361002, 361163, 361166, 361146, 361150, 361386, 361598, 361928, 362000
SAFETY DEVICES
361371, 361923
SAFETY EDUCATION
348774, 348775, 349655, 349644, 349841, 361038, 361039, 361595, 361502, 361917
SAFETY ENGINEERING
348777, 348778
SAFETY FACTORS
361301, 361300
SAFETY FEATURES
362013
SAFETY MEASURES
348748, 348773, 349110, 349841, 349813, 349814, 361566, 361568, 361596, 361944
SAFETY PRACTICES
349814, 349813, 349857, 349841, 361596, 361595, 361917
SALES
337224, 346161, 346661, 349865
SAMPLING
349657, 349642
SANCTIONS
361754, 361752
SAVINGS
337892, 337893, 348759, 349253, 349838, 361382
SCALE MODEL
361606
SCHEDULING
349262
SCHOOL BUS DRIVERS
361496, 361497
SCHOOL BUSES
318413, 346146, 346143, 346144, 346755, 346756, 349816, 349863, 361366, 361497, 361607, 361570, 361569, 361778, 361930, 361990, 361989
SCHOOL CHILD TRAFFIC SAFETY
345075, 345067, 346124, 345068, 346163, 345065, 346164, 348944, 348943, 349278, 364988
SCRAP
349862
SEARCHING
361034
SEATS
318413, 345484
SELECTING
344258, 361177
SELF RESTORING BARRIERS
361371
SEMITRAILERS
361364, 361589, 361932
SENSITIVITY
349889, 361923
SEQUENCING
347741
SERVICE LIFE
349862
SERVICE STATIONS
361353, 361773
SERVICEABILITY
325077

SERVICES
346033
SEVERITY
309861, 344598, 349036, 349508, 361154, 361162, 361170, 361169,
361172, 361167, 361168, 361178
SEX
348129, 349255, 349889, 361614
SHORT TERM
335739, 348750, 361601, 361509
SHOULDER ACCIDENTS
361180
SHOULDER HARNESS
361163
SHOULDERS
348355, 349891
SHUTTLE BUS
361604
SIDE COLLISION
344504, 344598, 345654, 345484, 349036, 361154, 361165, 361155,
361150, 361157, 361156, 361606, 361565
SIGHT DISTANCE
341108, 335162, 334829, 361364
SIGN BACKGROUND
361322
SIGN LEGEND
361030, 361322
SIGNALIZED INTERSECTIONS
348861, 349152, 361376, 361940
SIGNS
361036
SIMULATION MODELS
335156
SIMULATIONS
318905, 318911, 361487
SINGLE VEHICLE ACCIDENTS
342083, 344111, 346118, 345484, 346117, 348933, 349916, 361757, 361998
SIRENS
344258, 361317
SITES
348356
SIZE
335161, 331278, 349824, 361355, 361298
SIZE AND WEIGHT LAWS
361924, 361925
SKID RESISTANCE
361753
SKIDDING
349815, 364989
SKIDS
349491, 361589
SKILLS
329640, 361555, 361936
SLACK ADJUSTMENT
361592
SLED TESTS
346680, 361045, 361166, 361163, 361164, 361155, 361989
SLEDS
344504
SLEEP
361609
SLIP BASES
341009
SLIPS
349825
SMALL CAR
337224, 346019, 348749, 348728, 348752, 349660, 349497, 361028,
361298, 361596, 361487, 361597, 361489, 361912, 361999
SMALL TOWNS
349874
SMOKING
349873
SNOW & ICE CONTROL
361327
SNOW TIRES
361605
SNOWDRIFTS
361327
SOCIAL DRINKING
361755
SOCIOLOGICAL ASPECTS
345207, 348569, 349886
SOLID STATE
361767
SOLVENT EXTRACTION TESTS
361372
SOLVENTS
361372
SONIC ALARMS
349640
SPACING
334829
SPARK IGNITION ENGINES
344526, 349643, 349826, 361554
SPECIAL PURPOSE
361366
SPECTROMETERS
361304
SPECTROSCOPIC ANALYSIS
361304
SPEED
341403, 349856, 349854, 349815, 361766, 361933
SPEED CHANGES
349837, 361320
SPEED CONTROL
337893, 337892, 361181, 361611
SPEED LIMITS
330780, 343739, 346122, 344440, 346111, 346199, 348753, 348752,
348728, 348918, 361036, 361320, 361322, 361492, 361752, 362011, 362000
SPEEDING
349843, 361482, 361926
SPEEDOMETERS
361305
SPINE
361152, 361167
STANDARDIZATION
346067, 346068, 348772, 349192, 361481, 361356, 361934
STANDARDS
344258, 318413, 343728, 346018, 345063, 348768, 349257, 349846,
361306, 361305, 361567, 361505, 361935, 361997
STARTING
349826
STATE GOVERNMENT
335421, 335717, 346109, 346196, 348752, 346670, 348753, 348759,
348773, 349192, 349184, 361567, 361557, 361569, 361570, 361559,
361909, 361916, 361996, 364847, 362011
STATE HIGHWAY ADMINISTRATION
361555
STATE OF THE ART STUDIES
341439, 335154, 342142, 346143, 346021, 346146, 346144, 346756,
346755, 349828, 349830, 349885, 361017, 361604, 361771, 361990
STATE PLANNING
361556
STATE TRANSPORTATION DEPARTMENT
361378
STATES
349492, 349661, 349663, 349662, 349495, 349664, 361377, 361610,
361754, 361752, 362006, 362015
STATISTICAL ANALYSIS
197699, 342083, 344609, 346018, 346111, 349658, 349039, 349855,
349858, 349813, 361033, 361016, 361939, 361942, 361770, 361998
STATISTICAL SAMPLING
361313
STATISTICS
341634, 341523, 348744, 348753, 348746, 348751, 349454, 349871,
349866, 349870, 349868, 361175, 361039, 361038, 361174, 361377,
361361, 361180, 361178, 361368, 361379, 361367, 361299, 361362,
361493, 361559, 361602, 361932, 361770, 361760, 361930, 361933,
361937, 361615, 362002, 362006, 362015
STATUTE CASES
349875, 361918
STEADY STATE
344416, 349643
STEEL BRIDGES
361017
STEEL STRUCTURES
361017
STEELS
344501, 349867
STEERING
341109, 346019, 349035, 349853, 349877, 361772, 361908, 361994, 362013
STEERING COLUMN
345699

STEERING CONTROL
349853, 349854, 361772
STEERING GEAR
361363
STEERING WHEEL
345178, 349328
STEREOSCOPIC PHOTOGRAPHY
345654
STIRLING ENGINES
361040
STOLEN VEHICLES
361359
STOP SIGNS
361944
STOPPING
349887
STOPPING DISTANCES
341402, 349257, 361507, 361592, 364989
STRAINS
361499
STRATEGY
348750
STRATIFIED CHARGE ENGINE
361552
STRESSES
349491, 361499
STRIPPING
361943
STRUCTURAL ANALYSIS
349861
STRUCTURAL BEHAVIOR
362007
STRUCTURAL DESIGN
331278, 349861, 361561, 361562, 361563
STRUCTURAL FAILURES
361017
STUDDED TIRES
361605
STUDENTS
361572
SUBCOMPACT CAR
361298
SUBMARINING
361166, 361167
SUBSTITUTES
344501
SUGAR
349881
SUICIDES
361316
SUPPLY AND DEMAND
347733, 347732
SURFACE IGNITION
361929
SURVEILLANCE
335914
SURVEYS
335914, 349857
SURVEYS /DATA COLLECTION/
334834, 346145, 348755, 349832, 361365, 361911
SURVIVAL
361992, 361907
SUSPENSIONS
361309, 361766, 362013
SWAYING
361768
SWEDISH STATE RAILWAYS
348423
SWIRL SPEED
361775
SYLLABUS
361572
SYMBOLS
347741
SYMPOSIA
348756, 349492
SYNTHETIC FUELS
349660
SYNTHETICS
361507
SYSTEMS ANALYSIS
361927
SYSTEMS APPROACH
348777

T

TABLES /DATA/
361016, 361615
TANKERS
349833, 361612
TARGET DETECTION
361034
TASK ANALYSIS
345068, 345067
TECHNOLOGICAL INNOVATION
349884, 361494
TECHNOLOGY
342113, 349494, 361374, 361373, 361489
TECHNOLOGY TRANSFER
361549, 364988
TEENAGERS
361041, 361173, 361369, 361943, 361937, 361759
TEMPERATURE
361383
TEMPORARY
335992
TERMINOLOGY
361590
TEST FACILITIES
346067, 346068, 348745, 361555, 361913
TEST METHODS
348745, 349889, 361555, 361908, 361755, 361929, 361772
TESTIMONY
361308
TESTING
349643, 349837, 361599, 361945, 361929, 361936, 361761, 361923, 361908
TESTING EQUIPMENT
346067, 346068, 344447, 344446
THEFT
349640, 349824, 361359, 361307, 361325, 361368, 361501, 361500, 361943
THEORETICAL ANALYSIS
349844
THERMAL CONDITIONS
361309
THORAX
349890, 361158, 361161, 361162, 361163, 361160, 361154, 361164, 361157
TIMBERS
335992
TIME
361385
TIME DEPENDENT PARAMETERS
348933
TIME FACTOR
361362, 361933, 361930, 361932
TIME SAVING METHODS
349839
TIME SERIES
346111
TIME SERIES ANALYSIS
361319
TIRE BELT
362007
TIRE DISABLEMENT
361308
TIRE INFLATION
349035
TIRE-PAVEMENT INTERFACE
349491, 349815, 349859, 361042, 361766, 362007
TIRES
343714, 346700, 346698, 346699, 349191, 349491, 349190, 349490, 349818, 349859, 349819, 349841, 349825, 361308, 361355, 361302, 361510, 361547, 361546, 361511, 361544, 361613, 361545, 361605, 361548, 361566, 361776, 361766, 361910, 362005
TOLERANCES
349890
TORQUE CONVERTERS
349034
TORSION
349032
TOTAL BODY WATER
361508

TOWING
361596, 361768
TRACKED VEHICLES
349859
TRACTION
349850, 361910
TRACTOR TRAILERS
346170, 349839, 349822, 349854, 361364, 361589, 361923, 361932
TRACTORS
344609
TRAFFIC
345061
TRAFFIC ACCIDENT ANALYSES
349657, 361762, 361770, 362003
TRAFFIC ACCIDENT CAUSES
361770, 362003
TRAFFIC ACCIDENT ECONOMIC EFFECTS
349622, 361312, 361770
TRAFFIC ACCIDENTS
319845, 330775, 197699, 335739, 342142, 341634, 345064, 348357, 348933, 348861, 348751, 348746, 348364, 348569, 348752, 349495, 349110, 349152, 349658, 349816, 361361, 361314, 361320, 361318, 361362, 361774, 361927, 362001, 362002
TRAFFIC ACTUATED SIGNALS
361940
TRAFFIC CIRCLES
348841
TRAFFIC CONFLICTS
345064, 348861, 348943
TRAFFIC CONTROL
330780, 348957, 349830, 349829
TRAFFIC CONTROL DEVICES
335162, 349454
TRAFFIC CONVICTION
335739, 361570, 361569
TRAFFIC COUNTING
345868, 361313
TRAFFIC COURTS
361175, 361569, 361570
TRAFFIC DELAY
348957, 361384
TRAFFIC ENGINEERING
335156, 361942
TRAFFIC ENGINEERS
349874
TRAFFIC FLOW
348128, 348861, 349277
TRAFFIC FLOW PATTERN
349262, 361940
TRAFFIC LAW ENFORCEMENT
335914, 344443, 331446, 346111, 346109, 346199, 361376, 361382, 361492, 361926
TRAFFIC LAWS
344422, 314063, 335740, 349661, 349641, 349664, 349256, 349663, 349508, 361376, 361384, 361926, 362000
TRAFFIC MANAGEMENT
349830
TRAFFIC MARKINGS
335992, 347921, 347920
TRAFFIC NOISES
349037, 361303
TRAFFIC OPERATIONS
361323
TRAFFIC POLICE
344443
TRAFFIC RECORDS
349495
TRAFFIC REGULATION
348746, 349872, 362000
TRAFFIC RESTRAINT
361921
TRAFFIC SAFETY
341439, 197699, 331446, 341523, 326369, 314063, 335739, 346181, 345062, 348751, 348943, 346670, 348763, 346686, 349492, 349442, 349253, 349874, 361384, 361569, 361570, 361568, 361991, 362000, 364988
TRAFFIC SAFETY EDUCATION
335718, 319845, 302437, 344440, 344445, 344439, 346163, 346109, 346164, 346124, 345068, 345067, 345065, 345069, 345075, 346165, 345070, 349496, 348943, 349879, 349887, 361059
TRAFFIC SCHOOLS
335739
TRAFFIC SIGN DESIGN
342376, 347741, 349883
TRAFFIC SIGN LEGIBILITY
361030
TRAFFIC SIGN OBSERVANCE
345062, 361322
TRAFFIC SIGN VISIBILITY
335160
TRAFFIC SIGNAL COORDINATION
361940
TRAFFIC SIGNAL TIMING
361600, 361940
TRAFFIC SIGNALS
335161, 349641
TRAFFIC SIGNS
341108, 335162, 347920, 347921, 348944, 361030, 361044, 361322, 361384, 361314
TRAFFIC SIMULATION MODELS
361315
TRAFFIC SPEED
330780, 341402, 334829, 349830, 349882, 361181
TRAFFIC SURVEILLANCE
349152, 361181
TRAFFIC VIOLATORS
334834, 335914, 335739, 346033, 348727, 348746, 349261, 349152, 349658, 349262, 349917, 349843, 361300, 361376, 361301, 361915, 361926
TRAFFIC VOLUME
348933, 348861, 349277, 349830, 349882
TRAILER HITCHES
361768
TRAILERS
361768
TRAINING
361353
TRAINING AIDS
326369, 345069, 345070, 361572
TRAINING PROGRAMS
361603
TRANQUILIZERS
349649
TRANSFER FUNCTIONS
349825
TRANSIENT RESPONSE
349643, 361908, 361772
TRANSMISSION
361302, 362013
TRANSPORTATION
361369
TRANSPORTATION ADMINISTRATION
348754
TRANSPORTATION LAWS & REGULATIONS
347884, 348545, 361493
TRANSPORTATION MODELS
345868
TRANSPORTATION PLANNING
335717, 348750
TRANSPORTATION POLICY
361764
TRANSPORTATION REGULATION
361764
TRANSPORTATION SYSTEM MANAGEMENT
361323, 361769
TRANSPORTATION SYSTEMS
347884
TRAUMA
348775
TRAVEL
361377
TRAVEL DEMAND
345868
TRAVEL PATTERNS
345207, 348750
TRAVEL TIME
337892, 337893, 348957
TREADS
349818, 349819, 361511, 361545, 361544, 361510, 361548, 361546, 361547
TREATMENT PROGRAMS
335739, 361601, 361907
TREES /PLANTS/
344111, 345484, 349036, 361044, 361757

TRENDS
337224, 346161, 348728, 361493, 361568, 361991
TRIALS
361308
TRIP DISTRIBUTION
345868
TRIP GENERATION
345868, 361773
TRUCK BRAKES
361613, 361599, 361923
TRUCK DRIVERS
342142, 349652, 349878, 361026, 361388, 361553
TRUCK LAWS & REGULATIONS
361925, 361924
TRUCK NOISE
349831
TRUCKING INDUSTRY
348545
TRUCKS
325077, 330780, 335421, 342142, 343739, 344609, 348129, 348364, 348752, 349328, 349034, 349257, 349865, 349839, 361174, 361172, 361362, 361353, 361484, 361613, 361499, 361500, 361993, 361944, 361778, 361932, 361934, 361994, 361760, 361943, 361935, 361930, 364879
TUBES
335162
TURBOCHARGING
361553
TURN SIGNALS
345021
TURNING MOVEMENTS
348861, 349887, 362014
TWO DOOR CARS
349824, 349820, 349827
TWO DOOR VEHICLES
349851, 361298
TWO LANE HIGHWAYS
341403, 345178, 347921, 348129, 347920
TWO STROKE CYCLE ENGINES
361503
TWO WAY TRAFFIC
347920, 347921
TWO WHEEL DRIVE
361302
TWO-WHEELED VEHICLES
361603, 361594, 361602

U

UNDERRIDE GUARDS
361002
UNDERRIDE-OVERRIDE COLLISIONS
361364
UNEMPLOYMENT
361360
UNIFORM TIRE QUALITY GRADING
361355
UNIFORM TRAFFIC LAWS
349661, 349663, 361591, 361569, 361570
UNIFORM VEHICLE CODE
335740, 349664, 349663, 349662, 349192, 349661, 361557, 361918
UNIFORMITY
361317
UNITED STATES GOVERNMENT
335717, 335421, 346109, 348753, 349656, 349492, 349653, 349495, 349654
UNREGULATED EXHAUST EMISSIONS
361372
UNSAFE DRIVERS
335739, 346122, 346121, 346125, 349917
UNSIGNALIZED INTERSECTIONS
349256
URBAN AREAS
341634, 345207, 345061, 349256, 349152, 349829, 349831, 361377, 361571
URBAN HIGHWAYS
349277
URBAN TRANSPORTATION
345207
URBAN TRANSPORTATION PLANNING
349852, 361604
URETHANE
361179
USED CARS
329043, 337224
USER CHARACTERISTICS
348729, 349860
USER NEEDS
335156
USER PREFERENCES
344506
USER REACTIONS
344437, 344506
UTILITY POLES
331446, 361044, 361371
UTILITY THEORY
361927
UTILITY VEHICLES
361368, 361367, 361912
UTILIZATION
331446, 335914, 344437, 349861, 344422, 345060, 348755, 349508, 349655, 349255, 349442, 349917, 361059, 361177, 361299, 361607, 361911, 361928

V

VALIDATION
346698, 346680, 346699, 346700
VALIDITY
342083
VANPOOLS
348750, 349840
VANS
361174, 361368, 361367, 361604, 361929
VAPORIZATION
349826
VARIABLES
342083, 347899
VARIANCE
361316
VARIATIONS
346068, 346067
VEGETATION
361327
VEHICLE AGE
348129, 349917
VEHICLE CHARACTERISTICS
349816, 349869, 361933
VEHICLE CLASSIFICATION
361313
VEHICLE COMPONENTS
343728, 349191, 349190, 364878, 362012
VEHICLE CONTROL
345021, 349850, 361042, 361611, 361768
VEHICLE DESIGN
318413, 342113, 325077, 344526, 344506, 345699, 345484, 348943, 347899, 348022, 349036, 349660, 349833, 349831, 361171, 361037, 361043, 361169, 361356, 361302, 361357, 361366, 361554, 361612, 361999, 362013, 362014, 362012
VEHICLE DETECTION
349193
VEHICLE DYNAMICS
349648, 349859, 361484, 361613, 361772
VEHICLE HANDLING
341465, 341634, 346019, 361484, 361768, 361994
VEHICLE INSPECTION
343714, 346190, 346191, 346189, 346188, 346187, 361374, 361388, 361373, 361569, 361497, 361570, 361777, 361778
VEHICLE INTENSIVE
361773
VEHICLE LATERAL PLACEMENT
349850
VEHICLE LIGHTING
344258, 348022, 349193
VEHICLE MAINTENANCE
346189, 346142, 349822, 361373, 361374, 361778
VEHICLE MAKE
349191, 349190, 361178, 361174, 361506, 361512, 361929
VEHICLE MILES
348728, 349039
VEHICLE OCCUPANCY
348750, 361313
VEHICLE PERFORMANCE
344447, 344446, 346142, 347899, 349660, 364878, 364880
VEHICLE RESPONSES
349035, 349850, 361768, 361908

VEHICLE SIZE
343739, 349653, 349917
VEHICLE SPEED
331278, 330780, 335992, 344623, 345484, 347899, 348129, 349035, 349329, 361171, 361322, 361923, 364989
VEHICLE SUSPENSION SYSTEMS
361613, 361994
VEHICLE TRANSMISSIONS
361562, 361554, 361561
VEHICLE TYPE
362006
VEHICLE WEIGHT
343728, 343714
VEHICLES
343681, 343713, 343716, 348545, 349190, 349191, 349869, 349870, 349868, 349866
VEHICULAR SAFETY
342113, 346189, 348355, 361002, 349916
VELOCITY
343667, 345654, 361045, 361172, 361162
VELOCITY DISTRIBUTION
361775
VELOCITY MEASUREMENT
344623
VERTICAL DYNAMICS
349825
VIBRATIONAL TESTING
349861
VIBRATIONS
349032, 349859, 361037, 361489, 361766
VIDEOTAPE
345069, 349644
VIGILANCE
361761
VIOLATIONS
314063
VISIBILITY
335161, 335162, 334826, 341402, 334829, 335155, 335154, 335157, 335159, 345180, 361364, 361995
VISION
349662
VISION CHARACTERISTICS
361034
VISUAL AIDS
361550
VISUAL PERCEPTION
335157, 361483
VOLATILITY
349826
VOLKSWAGEN
348770

W

WAITING TIME
361763
WALKING
361311
WARNING LETTERS
335739
WARNING SIGNS
347741, 348355, 349821
WARNING SYSTEMS
344258, 361043, 361317, 361609
WARRANTY PROTECTION
361509
WATER TRANSPORTATION
341523
WEAR
349818, 361546, 361547, 361548, 361544, 361545
WEAR TESTS
349819, 361511, 361510, 361910
WEATHER
335160, 348129, 349843
WEIGHT
318413, 349849
WEIGHT CONTROL
344501
WEIGHT PROPAGATION EFFECT
362012
WEIGHT REDUCTION
362012
WET CONDITIONS
345061, 361507, 361768
WET PAVEMENTS
349815, 361753
WHEEL CHAIRS
346144, 346146, 346145, 346143, 346755, 348776, 346756, 361164, 361045, 361990, 361989
WHEEL LOCK
361042
WHEEL SLIDE
362014
WHEEL SLIP
362014
WHEELS
361484, 361766
WIDENING
348355, 349882
WIDMARK EQUATION
361508
WIDTHS
349882, 361302
WINDSHIELDS
345699, 361995
WINTER DRIVING
361605
WIPERS
345021
WITNESSES
349657, 349836
WORKING HOURS
349821, 349878
WORKSHOPS /MEETINGS/
318981, 342142, 344443, 346109, 349496, 349493, 349874, 364988
WORLD CAR
361356

Y

YOUNG ADULTS
334866, 361369
YOUNG DRIVERS
335718, 346670, 346021, 346181, 348727, 349527, 349917, 361319, 361316, 361321, 361759, 361998

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HIGHWAY SAFETY LITERATURE

Concurrent with HRIS Abstracts

WINTER 1982

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CONTENTS

FOREWORD iv

AVAILABILITY OF DOCUMENTS v

LOAN AND PHOTOCOPY SERVICES vi

FOREIGN LANGUAGE DOCUMENTS vii

ABBREVIATIONS viii

EXAMPLES OF ABSTRACTS ix

*ABSTRACTS OF RESEARCH REPORTS, TECHNICAL PAPERS IN CONFERENCE PROCEEDINGS, AND JOURNAL ARTICLES 1

SOURCE INDEX 99

AUTHOR INDEX 106

RETRIEVAL TERM INDEX 112

***NOTE: HRIS selections pertaining to SAFETY, subject area number 51, are included in this publication.**

FOREWORD

Highway Safety Literature (HSL) is a quarterly publication compiled from the computer tape records of the Transportation Research Board (TRB). Issues of ***Highway Safety Literature*** are published and mailed concurrently with the quarterly issues of ***HRIS Abstracts.*** This issue is the second of the reactivated and remodeled ***Highway Safety Literature*** series; the final issue of the previous series was published in September 1980.

This issue of ***Highway Safety Literature*** contains abstracts of research reports, technical papers in conference proceedings, and journal articles that were stored on the magnetic tape files of the TRB during the fall of 1982. Each issue of ***Highway Safety Literature*** consists of four sections: (a) the abstracts of research reports, technical papers in conference proceedings and journal articles listed in ascending numerical order of the Transportation Research Information Services (TRIS) accession numbers; (b) a source index containing corporate authors and addresses, and publication sources, (c) an author index containing names of personal authors and coauthors of reports, papers, and articles; and (d) a retrievel term index containing subject terms from the Highway Research Information Service (HRIS) Thesaurus Term List, and other terms useful in retrieval operations. Explanatory notes are given at the beginning of the document record (abstract) section and on the first page of each index.

The majority of selections for this publication has been made by the Technical Reference Division professional staff of the National Highway Traffic Safety Administration (NHTSA) of the U.S. Department of Transportation. The NHTSA selections are augmented by document records from the subject area on SAFETY (number 51) of the HRIS data base. The HRIS selections on SAFETY were made by the professional staff of TRB with the assistance of committee members. The HRIS subject area SAFETY selections include contributions from the Federal Highway Administration of the U.S. Department of Transportation; the International Road Federation; the U.K. Transport and Road Research Laboratory (TRRL), which is the English-language center for the International Road Research Documentation (IRRD) network of the Organization for Economic Cooperation and Development; the Safety Research Information Service of the National Safety Council; the American Society of Civil Engineers; the National Cooperative Highway Research Program; the state highway and transportation departments; universities; and others. Abstracts of FHWA research and development reports and studies are approved by the professional staff of FHWA.

Special acknowledgment is given to the U.K. Transport and Road Research Laboratory for abstracts of non-U.S. publications, technical papers, and reports. Such abstracts are the result of an agreement whereby HRIS document records are exchanged through TRRL with abstracts that are part of the information store of the International Road Research Documentation system. Professional TRB staff select for entry into HRIS those IRRD abstracts that would be of greatest interest to the transportation community in the United States. Thus, the issues of ***Highway Safety Literature*** and ***HRIS Abstracts*** contain only a subset of the total IRRD file. The complete IRRD file is available from the IRRD Secretariat, 19 rue de Franqueville, 75 Paris 16e, France (telephone 1-524.92.42). Summaries of ongoing research projects as well as abstracts of published works may be purchased from IRRD in either computer magnetic tape form or hard-copy form. The summaries and abstracts are available in three languages: English, French, and German.

All readers are invited to furnish comments and suggestions that will further enhance the usefulness of ***Highway Safety Literature*** and/or ***HRIS Abstracts.***

The abstracts published in this issue are also included in TRIS, available for on-line retrieval from file 63 of DIALOG Information Services, Inc. (details on page ii).

AVAILABILITY OF DOCUMENTS

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When no availability is specified, the user should consult an established transportation library.

A loan service for publications and a photocopy service for articles and papers are available at document delivery centers as explained on page vi.

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(All documents available through OECD)
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ESL
Engineering Societies Library
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IEEE
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Telephone 212-981-0060

IPC
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New York, NY 10017
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75 Paris, France
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ITS
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NAE/NAS/NRC
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NTIS
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NTCL
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Organization for Economic Cooperation
and Development
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PPI
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RTAC
Roads and Transportation Association of Canada
875 Carling Avenue
Ottawa, Ontario K1S5A4, Canada
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SAE
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ESL	Engineering Societies Library
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GPO	Government Printing Office of the U.S.
HRIS	Highway Research Information Service, Transportation Research Board
HSRI	Highway Safety Research Institute
HUD	Department of Housing and Urban Development of the U.S.
IOM	Institute of Medicine, National Academy of Sciences
IPR	Institute of Road Research, Brazil
IRF	International Road Federation
IRRD	International Road Research Documentation, Organization for Economic Co-operation and Development
ITS	Institute of Transportation Studies, University of California, Berkeley
NAS	National Academy of Sciences
NAE	National Academy of Engineering
NHTSA	National Highway Traffic Safety Administration, U.S. Department of Transportation
NRC	National Research Council, NAS-NAE
NTIS	National Technical Information Service
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TRRL	Transport and Road Research Laboratory of the United Kingdom
UITP	International Union of Public Transport
UMI	University Microfilms International
UMTA	Urban Mass Transportation Administration, U.S. Department of Transportation

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AD	a prefix for order numbers of documents available from NTIS
App	appendixes
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Fig	figures
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INTL	International
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No	Number
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pp	pages
P.O.	Post Office
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Repr	reproduction
Res	Research
RP	Repository
Rpt	Report
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U.S.	United States
Vol	Volume

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Title	**DRUG RESEARCH METHODOLOGY. VOLUME I. THE ALCOHOL-HIGHWAY SAFETY EXPERIENCE AND ITS APPLICABILITY TO OTHER DRUGS**
Abstract	The report presents the findings of a workshop concerning the alcohol and highway safety experience, which includes research efforts to define the drinking-driving problem and societal responses to reduce the increased highway safety risk attributable to alcohol. A cross-disciplinary panel of experts examined its history, methodologies employed in research, and approaches to the development and implementation of preventive measures (countermeasures). From these discussions a conceptual framework for use in comparing alcohol and other drugs was developed. Categories include (1) the process of risk identification; (2) measures of risk to indicate impaired driving ability; and (3) approaches to preventive measures that reduce the increased highway safety risk attributable to alcohol and other drugs. The report summarizes comparisons between alcohol and other drugs.
Authors, Publication Data, Document Data, HS Number	Donelson, AC Marks, ME Jones, RK Joscelyn, KB Highway Safety Research Institute, National Highway Traffic Safety Administration Final Rpt. UM-HSRI-80-17, HS-805 374, Mar. 1980, 74p, 39 Ref. Volume 2 is HS-805 299; Volume 3 is HS-805 375; Volume 4 is HS-805 485; and Volume 5 is HS-805 462. See also HS-803 879 and HS-805 461.
Contract Number	Contract DOT-HS-7-01530
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Document Order Data	PB80-223522

JOURNAL ARTICLE

TRIS Accession Number	**319845**
Title	**BICYCLING INJURIES**
Abstract	The increase in the use of bicycles has been paralleled by an increase in bicycle accidents. Safety education programs, especially for young people, might reduce the number of injuries. (A)
Authors, Publication Data, Document Data, HS Number	Davis, MW Litman, T Crenshaw, RW Mueller, JK *Physician and Sports medicine* Vol. 8 No. 5, HS-032 426, May 1980, pp 88-96, 4 Tab., 2 Phot., 14 Ref.
TRB Information Source	ACKNOWLEDGMENT: National Safety Council, Safety Research Info Serv (800428J)
Availability	ORDER FROM: McGraw-Hill, Incorporated, 1221 Avenue of the Americas, New York, New York, 10020

ABSTRACTS OF RESEARCH REPORTS, TECHNICAL PAPERS IN CONFERENCE PROCEEDINGS, AND JOURNAL ARTICLES

318464

EFFECTS OF RECENT VEHICLE DESIGN CHANGES ON SAFETY PERFORMANCE, VOLUME I

Design changes in 1974-1977 model year passenger cars have been identified and a preliminary evaluation has been made of the safety effects of design changes inspired by fuel economy requirements. The 1977 General Motors full-size cars and the Volkswagen Rabbit were found to be the only significant design change vehicles. These vehicles do not demonstrate significantly higher risks of fatality in accidents than do other vehicles of similar weight or roominess. Little change is observed in the aggregate characteristics of the 1974-1977 vehicle fleets, although the effects of the 1977 General Motors downsizing are observable. Methodologies have been implemented for the identification of vehicle design changes, for the calculation of observed fatality rates by make and model, and for the projection of future fatality and injury experience based on perceived trends in vehicle design and sales.

Redmond, D Schmitz, B Friedman, K
Kinetic Research, National Highway Traffic Safety Administration Final Rpt. KR-TR-032-VOL-1, HS-805 378, Mar. 1979, 179p
For summary report, see HS-805 377, Vol 2 is HS-805 379.
Contract DOT-HS-7-01759

ACKNOWLEDGMENT: NTIS
ORDER FROM: NTIS PB80-200066

318465

EFFECTS OF RECENT VEHICLE DESIGN CHANGES ON SAFETY PERFORMANCE, VOLUME II

Design changes in 1974-1977 model year passenger cars have been identified and a preliminary evaluation has been made of the safety effects of design changes inspired by fuel economy requirements. The following appendices are enclosed: Ranking of changes in curb weight 1974 to 1977 model year passenger cars; Unranked tabulation of scaled fractional changes in all parameters 1974 to 1977 model year passenger cars; Ranked differences of subject models from models of similar roominess; Models most similar to given models based on average scaled fractional difference over nine design parameters; Make and model coding tables FARS and VW engineering model data base; Excerpts from April 1978 progress report; Output from run 1 and 1 of the Kraesp model; and Comparison of alternative input data to the Kraesp model.

Redmond, D Schmitz, B Friedman, K
Kinetic Research, National Highway Traffic Safety Administration Final Rpt. KR-TR-032-VOL-2, HS-805 379, Mar. 1979, 288p
For Summary report, see HS-805 377; Vol 1 is HS-805 378.
Contract DOT-HS-7-01759

ACKNOWLEDGMENT: NTIS
ORDER FROM: NTIS PB80-200074

318487

THE EFFECTS OF AUTOMOBILE INSPECTIONS ON ACCIDENT RATES

The study was conducted to determine the effects the Alabama Auto Check automotive diagnostic inspection facility has had on the accident rate of Huntsville residents having accidents in Madison County, Alabama. A previous study indicated that the inspected vehicle was 12 percent less likely to be involved in an accident. The previous study observed the accident history of individual vehicles for 13 months and used one method of determining accident rate improvement. The present study on the other hand, observed the vehicles for 21 months and with the larger sample size used three independent methods of determining accident rate improvement.

Schroer, BJ Peyton, WF
Alabama University, Huntsville, National Highway Traffic Safety Administration Final Rpt. HS-805 401, Aug. 1977, 85p
Cover date is 1980. Sponsored in part by Alabama Office of Highway Traffic Safety.
Contract DOT-HS-5-01056

ACKNOWLEDGMENT: NTIS
ORDER FROM: NTIS PB80-201304

318496

FMVSS 212, 219, 301 TESTING OF ELECTRIC VEHICLES, ELECTRA VAN 1000, ELECTRA VAN 1000P

This report presents the results of two electric vehicle-to-NHTSA Fixed Test Device head-on crash tests. These tests were conducted to determine if the vehicles would comply with the fuel spillage requirements of Federal Motor Vehicle Safety Standard (FMVSS) 301, Fuel System Integrity, the windshield retention requirements of FMVSS 212, and the windshield zone intrusion requirements of FMVSS 219. The standard fixed barrier was replaced by the 40-load cell NHTSA Fixed Test Device for both tests.

Pozzi, M
Dynamic Science, Incorporated, National Highway Traffic Safety Administration Final Rpt. 3042-80-067, HS-805 441, Mar. 1980, 162p
Contract DOT-HS-8-01942

ACKNOWLEDGMENT: NTIS
ORDER FROM: NTIS PB80-202153

318499

AUTOMATIC SAFETY BELT SYSTEMS OWNER USAGE AND ATTITUDES IN GM (GENERAL MOTORS) CHEVETTES AND VW (VOLKSWAGEN) RABBITS

The study was designed to: (1) evaluate the effectiveness of automatic restraint systems in increasing belt usage, and (2) determine owner attitudes toward the system. Information gathered from owners of vehicles with automatic systems will assist NHTSA in determining levels of acceptance, and problems or areas of resistance to these systems. Such information provides an 'early warning' of critical problem areas that need to be resolved before automatic restraint systems become standard equipment in all cars. Data collected are derived from 2,341 telephone interviews with owners of GM Chevettes and VW Rabbits. Findings indicate that the automatic restraint system with an operative starter-interlock is highly effective as a use-inducing system. There are, however, certain comfort and convenience related problems with automatic systems that need to be resolved. Information programs directed at dealers and the public should help to ensure that the mandate for automatic belt systems is successful.

Phillips, BM Goodman, DM
Opinion Research Corporation, National Highway Traffic Safety Administration Final Rpt. 51495, HS-805 399, May 1980, 96p
Contract DOT-HS-7-01736

ACKNOWLEDGMENT: NTIS
ORDER FROM: NTIS PB80-202815

Highway Safety Literature

318500

TRAINING MATERIAL DEVELOPMENT FOR THE DART (DATA ANALYSIS AND REPORTING TECHNIQUES) SYSTEM

The purpose of the study was to develop, pilot test, and document a training program for the DART (Data Analysis and Reporting Techniques) system. DART is a computer system designed to aid states in identifying their own highway safety problems through analysis of their own accident data. The resultant training program consists of 15 units of instruction and requires 4-1/2 days of training time. The course emphasizes the practical aspects of working with the DART system tools. Approximately one-half of total training time is devoted to trainee practice. The training package consists of an Instructor Manual prepared to assist the instructor in the day-to-day conduct of each course lesson, a Trainee Manual prepared to serve as a resource document for individuals attending the DART training course, and a set of 50 illustrations (transparencies to be used with the overhead projector) prepared to assist instructor and trainee in achieving lesson and course objectives.

Cleven, AM
Dunlap and Associates, Incorporated, National Highway Traffic Safety Administration Final Rpt. ED-80-8, HS-805 444, May 1980, 18p
Contract DOT-HS-8-02058

Acknowledgment: NTIS
Order From: NTIS PB80-203011

318501

PICKUP AND VAN SIDE STRUCTURE BASELINE ASSESSMENT TESTS 1, 2, AND 3 VEHICLE-TO-VEHICLE 60 DEGREE LEFT SIDE IMPACT

The objective of these tests was to provide baseline data for unmodified pickup trucks and vans when involved in 60 degree left side vehicle-to-vehicle impact crashes. For these tests, the target vehicle was stationary and set at 60 degree to the line of travel of the bullet vehicle. The target vehicle was struck one inch rearward of the left DOR. The bullet vehicles for all three tests were 1978 Chevrolet Impala 4-Door Sedans. The target vehicles were as follows: 1978 Chevrolet C-10 Pickup, 1978 Ford Courier Pickup, and 1978 Ford E-150 Econoline Van.

Cropper, R
Dynamic Science, Incorporated, National Highway Traffic Safety Administration Final Rpt. 3053-79-196, HS-805 442, Nov. 1979, 265p
Contract DOT-HS-8-01942

Acknowledgment: NTIS
Order From: NTIS PB80-203110

318502

AN ASSESSMENT OF THE ADEQUACY OF NHTSA'S MOTOR VEHICLE SAFETY RESEARCH PLAN, FINDINGS OF A WORKSHOP

A workshop was held to evaluate the adequacy of the safety-related research and development activities planned in support of NHTSA's Five Year Plan for Motor Vehicle Safety and Fuel Economy Rulemaking. The document summarizes the deliberations and findings of that workshop.

Segel, L Weber, K
Highway Safety Research Institute, National Highway Traffic Safety Administration Final Rpt. UM-HSRI-79-34, HS-805 440, June 1979, 51p
Contract DOT-HS-9-02101

Acknowledgment: NTIS
Order From: NTIS PB80-203680

318506

EFFECTS OF RECENT VEHICLE DESIGN CHANGES ON SAFETY PERFORMANCE, EXECUTIVE SUMMARY

Design changes in 1974-1977 model year passenger cars have been identified and a preliminary evaluation has been made of the safety effects of design changes inspired by fuel economy requirements. The 1977 General Motors full-size cars and the Volkswagen Rabbit were found to be the only significant design change vehicles. These vehicles do not demonstrate significantly higher risks of fatality in accidents than do other vehicles of similar weight or roominess. Little change is observed in the aggregate characteristics of the 1974-1977 vehicle fleets, although the effects of the 1977 General Motors downsizing are observable. Methodologies have been implemented for the identification of vehicle design changes, for the calculation of observed fatality rates by make and model, and for the projection of future fatality and injury experience based on perceived trends in vehicle design and sales. There are a number of recommendations for further investigation of the effects of vehicle design on safety and for extension of the work to include 1978 and 1979 model year cars, light trucks and vans.

Redmond, D Schmitz, B Friedman, K
Kinetic Research, National Highway Traffic Safety Administration Final Rpt. HS-805 377, Mar. 1979, 7p
Volume 1 is HS-805 378; Vol. 2 is HS-805 379.
Contract DOT-HS-7-01759

Acknowledgment: NTIS
Order From: NTIS PB80-204035

318514

COST EVALUATION FOR NINE FEDERAL MOTOR VEHICLE SAFETY STANDARDS. TASK IX. SIDE DOOR STRENGTH, IDENTIFICATION AND COST EVALUATION OF DESIGN AND MANUFACTURING CHANGES

The contractor reviewed the price evaluation of FMVSS 214 performed under Contract No. DOT-HS-7-01767 and selected fourteen commensurate 1979 models and door beams and body pillars (if necessary). The components required were purchased and a weight and consumer price was obtained by the application and automotive component processing. Variable cost was determined by the application of 1979 model year production data. The consumer price was determined by extending the variable cost by the macro-analysis method based on data from 1978. The changes were categorized either by (1) improvement by engineering and/or manufacturing changes or (2) by sizing changes. Four 1979 models did not change, four were redesigned for engineering and manufacturing reasons, and four were downsized and two were upsized.

Harvey, MR Eckel, CE
De Lorean Motor Company, National Highway Traffic Safety Administration Final Rpt. HS-805 450, Nov. 1979, 54p
Contract DOT-HS-8-02015

Acknowledgment: NTIS
Order From: NTIS PB80-204928

318515

PICKUP AND VAN SIDE STRUCTURE BASELINE ASSESSMENT. TEST NO. 4. VEHICLE-TO-VEHICLE 60 DEGREE RIGHT SIDE IMPACT

The objective of the test was to provide baseline data for an unmodified pickup truck when involved in a 60 degree right side vehicle-to-vehicle impact crash. For this test, the target vehicle was stationary and set at 60 degrees to the line of travel of the bullet vehicle. The target vehicle was struck one inch rearward of the right door. The bullet vehicle for the test was a 1978 Chevrolet Impala 4-Door Sedan. The target vehicle for Test 3053-4 was a 1978 Ford Courier Pickup.

Pozzi, M
Dynamic Science, Incorporated, National Highway Traffic Safety Administration Final Rpt. 3053-80-080, HS-805 439, Mar. 1980, 89p
Contract DOT-HS-8-01942

Acknowledgment: NTIS
Order From: NTIS PB80-204951

318916

FMVSS 212/219/301 TESTING OF ELECTRIC VEHICLES SOUTH COAST TECHNOLOGY-ELECTRIC VW (VOLKSWAGEN) RABBIT; BATTRONICS VAN

The report presents the results of two electric vehicle-to-barrier head-on crash tests. These tests were conducted to determine if the vehicles would comply with the fuel spillage requirements of federal Motor Vehicle Safety Standard (FMVSS) 301, Fuel System Integrity, the windshield retention requirements of FMVSS 212, and the windshield zone intrusion requirements of FMVSS 219. The standard fixed barrier was replaced by the NHTSA Fixed Test Device with 40 load cells for the SCT Rabbit crash test. The electric vehicles tested in this report were the SCT Electric Rabbit, manufactured by South Coast Technology, Inc., Goleta, California; and the Battronics Van, manufactured by Battronic Truck Corporation, Boyerstown, Pennsylvania.

Highway Safety Literature

Pozzi, M
Dynamic Science, Incorporated, National Highway Traffic Safety Administration Final Rpt. 3042-79-186/1540, HS-805 402, Nov. 1979, 156p
Contract DOT-HS-5-01104

Acknowledgment: NTIS
Order From: NTIS PB80-207954

318930
NON-RESIDENT VIOLATOR COMPACT FISCAL IMPACT/COST EFFECTIVENESS: A CASE STUDY
The study was initiated by the National Highway Traffic Safety Administration (NHTSA) in an effort to determine the fiscal impact of membership in the Nonresident Violator Compact (NRVC), and to determine a method for advance assessment of that impact on potential members. Eight (8) jurisdictions, all members of the NRVC, were surveyed to determine their procedures and costs under the Compact. A cost effectiveness formula was generated, which consisted of expenses, reduced expenses, and income. Key reduced expense and income factors were: Number of traffic tickets issued to nonresidents from compact states, man hours saved per traffic stop, patrol officer's labor per hour, average number of miles saved by eliminating immediate arraignment, cost per mile, increased court revenues, and reinstatement fees. Key expense factors were: Patrol, court, and department of motor vehicle personnel costs, communication, forms, and data processing costs. When these factors were tabulated from the compact states surveyed, it was found that cost savings were significant. Further, when factors were tabulated in three non-compact states, cost savings were also significant.

Forman, NV Harrison, JF Joyce, WT
American Association of Motor Vehicle Admin, National Highway Traffic Safety Administration Final Rpt. HS-805 443, Mar. 1980, 191p
Contract DOT-HS-7-01803

Acknowledgment: NTIS
Order From: NTIS PB80-208127

318931
TECHNICAL ISSUES RELATED TO THE USE OF LORAN-C IN TERRESTRIAL APPLICATIONS
The extension of LORAN-C operations from Marine Services to terrestrial vehicle tracking applications in urban centers is discussed. Two successful experimental vehicle tracking systems, one in Philadelphia, PA and the other in Washington, DC are described. LORAN-C receiver parameters which must be upgraded for terrestrial use are identified and minimum receiver performance characteristics then suggested for land-based vehicle tracking.

Mitre Corporation, National Highway Traffic Safety Administration Final Rpt. HS-805 446, Dec. 1979, 50p
Contract DOT-HS-7-01549

Acknowledgment: NTIS
Order From: NTIS PB80-208184

318933
PROPOSED REAR VIEW MIRROR CHARACTERISTICS AND COSTS
A manufacturing/consumer cost analysis was performed comparing four families of mirror configuration (minimal required for regulation compliance, manufacturer's standard equipment, optional or upmarket, and aftermarket equipment) under present and proposed mirror regulations. Fleet composition (vehicles and mix of mirror configurations) was considered. Representative designs for each family were described with provision for breakaway or foldaway impact protection shown. Effects on fuel economy/consumption, capital equipment and tooling requirements, and maintenance impact were discussed. Significant differences in fuel economy were related to the addition of aftermarket mirror configurations to the model. These designs provide coverage exceeding requirements with accompanying increased weight and frontal surface area.

Mattson, S Cross, A Wakeley, H Viergutz, OJ
IIT Research Institute, National Highway Traffic Safety Administration Final Rpt. IITRI-T6009-T06, HS-805 473, Apr. 1980, 49p
Contract DOT-HS-9-02112

Acknowledgment: NTIS
Order From: NTIS PB80-208218

318935
EVALUATION OF SAFETY BELT EDUCATION PROGRAM FOR EMPLOYEES
The research was designed to determine the effectiveness of a nine-month safety belt educational program, utilizing various informational materials developed by NHTSA, in increasing safety belt usage among corporate employees. The materials used include an audio-visual slide presentation and a variety of pamphlets, brochures and booklets. Two U.S. corporations agreed to participate in the research and authorized their Safety Director at selected plant sites to implement the program. An evaluation of the program's effectiveness was accomplished by observing employees' use (or non-use) of safety belts as they entered/exited Company parking areas. The observation studies were conducted before the program was implemented, during the program, and after it had been completed. Two principal findings emerge from the research: (1) Corporate Safety Directors generally are reluctant to involve employees in an educational program directed specifically at safety belt usage, although they acknowledge the importance of such a program; (2) The observation studies conducted at the 'experimental' plants indicate that the nine-month educational program did not significantly increase usage of safety belts while driving to or from work.

Phillips, BM
Opinion Research Corporation, National Highway Traffic Safety Administration Final Rpt. 51489, HS-805 472, June 1980, 28p
Contract DOT-HS-7-01707

Acknowledgment: NTIS
Order From: NTIS PB80-208333

318938
OCCUPANT PROTECTION/SPEED LIMIT PUBLIC INFORMATION MATERIALS CATALOG NUMBER 2
The Occupant Protection/Speed Limit Public Information Materials Catalog is designed for use by persons developing public information programs on those topics. It lists materials produced for campaigns, along with journal articles and reports describing and evaluating such programs. Materials and reports listed in the catalog may be borrowed free of charge.

Grimm, AC Huber, KR
Highway Safety Research Institute, National Highway Traffic Safety Administration Final Rpt. UM-HSRI-80-34, HS-805 447, June 1980, 90p
Contract DOT-HS-9-02209

Acknowledgment: NTIS
Order From: NTIS PB80-209737

318939
AN ANALYSIS OF THE POTENTIAL LEGAL CONSTRAINTS ON THE USE OF ADVANCED ALCOHOL-TESTING TECHNOLOGY
An analysis was made of the potential legal constraints on the use of existing and proposed devices that would be used at the roadside by police officers to measure driver's blood alcohol concentrations. Examination of current law revealed the chief constraints to be: the constitutional requirement that searches and seizures be "reasonable"; state implied-consent legislation; and court decisions that require the retention of breath ampoules. Constraint resolution strategies include: administering active tests only when probable cause exists; amending implied-consent legislation to permit the use of new devices; and appealing adverse court decisions where necessary.

Ruschmann, PA Joscelyn, KB Greyson, M Carroll, HO
Highway Safety Research Institute, National Highway Traffic Safety Administration Final Rpt. UM-HSRI-80-32, HS-805 453, Apr. 1980, 69p
Contract DOT-HS-7-01536

Acknowledgment: NTIS
Order From: NTIS PB80-209851

318940
EFFECTIVENESS OF SAFETY BELT USAGE LAWS
The study involved the collection of data from a target group of 21 countries around the world. These countries were contacted or visited to collect the necessary data. A case study was written for each country visited. These case studies, which are quite extensive where data were available, form the bulk of the report. Specific issues were identified by DOT with regard to the seat belt laws that have been enacted. These issues have been discussed for each country where data were available. It was apparent from the data collected

that a major issue concerning the enactment of compulsory seat belt usage legislation has to do with the culture and psychological characteristics of the people within the country of interest. It was also found that one's expressed or observed attitude about seat belt usage and mandatory seat belt laws did not correlate with one's behavior regarding the wearing of seat belts. The main factors that influence the frequency with which a person wears his/her seat belt are the level of enforcement applied by the police, the natural propensity for the person to be law abiding and/or the person's personal perspective regarding his/her safety.

Fisher, FG, Jr
Peat, Marwick, Mitchell and Company, National Highway Traffic Safety Administration   Final Rpt. HS-805 490, May 1980, 295p
Contract DOT-HS-9-02104

ACKNOWLEDGMENT: NTIS
ORDER FROM: NTIS   PB80-209901

318944

ELECTRIC/CONVENTIONAL VEHICLE COMPARISON CRASH TEST

The report documents results of two tests conducted for NHTSA to compare the safety capabilities of an electric vehicle with those of a conventional internal combustion engine powered vehicle. Each vehicle was impacted into a flat fixed barrier at a nominal speed of 30 mph. Performance relative to Federal Motor Vehicle Standards 208, 212, and 310-75 were determined and the overall crashworthiness of the two vehicles was compared.

Pozzi, M
Dynamic Science, Incorporated, National Highway Traffic Safety Administration   Final Rpt. 3057-80-095, HS-805 438, Apr. 1980, 124p
Contract DOT-HS-8-01942

ACKNOWLEDGMENT: NTIS
ORDER FROM: NTIS   PB80-210164

318955

FMVSS (FEDERAL MOTOR VEHICLE SAFETY STANDARD) 212/219/301 TESTING OF ELECTRIC VEHICLES-ELECTRA VAN 600, EVA PACER

This report presents the results of two electric vehicle-to-NHTSA Fixed Test Device head-on crash tests. These tests were conducted to determine if the vehicles would comply with the fuel spillage requirements of Federal Motor Vehicle Safety Standards (FMVSS) 301, Fuel System Integrity, the windshield retention requirements of FMVSS 212, and the windshield zone intrusion requirements of FMVSS 219. The standard fixed barrier was replaced by the 40-load cell NHTSA Fixed Test Device. The electric vehicles tested in this report were: Electra Van 600, manufactured by Jet Industries, Inc., Austin, Texas and EVA Pacer, manufactured by Electric Vehicle Associates, Cleveland, Ohio. The Electra Van 600 was tested on June 13, 1979, at a speed of 30.34 mph, with the following results: (a) FMVSS 212-100% retention failure, (b) FMVSS 219-inconclusive due to FMVSS 212 failure, (c) FMVSS 301-16.7 oz measured in 5 minutes, estimated 7 gallons lost during 90 degrees rollover. The EVA Pacer was tested June 14, 1979, at a speed of 30.53 mph, with the following results: (a) FMVSS 212-2.5 in. of windshield separation, (b) FMVSS 219-9/16 in. into lower right corner of windshield protected zone by hood corner, (c) FMVSS 301-0.33 oz collected transimpact, 27 oz during 90 degrees rollover. Tank completely drained after 180 degrees roll. Small fire occurred immediately after impact.

Yee, R
Dynamic Science, Incorporated, National Highway Traffic Safety Administration   Final Rpt. 3042-79-125, HS-805 403, Aug. 1979, 179p
Contract DOT-HS-5-01104

ACKNOWLEDGMENT: NTIS
ORDER FROM: NTIS   PB80-212020

318962

DESIGN FOR THE EVALUATION OF FMVSS 208 USING POLICE BI-LEVEL ACCIDENT INVESTIGATION

This report presents a plan for performing an evaluation of the effectiveness of the automatic restraint requirements of FMVSS 208 using the standard police accident report augmented with a special one page form. The supplemental form is presented and documented along with a detailed plan for its implementation. A pilot test of the form and the training package revealed some deficiencies in training. The basic conclusion drawn was that such an evaluation would be quite feasible and relatively cost-effective, given that these deficiencies were corrected.

Brown, DB
Montevallo University, National Center for Statistics and Analysis   Final Rpt. HS-805 493, Nov. 1979, 177p
Contract DOT-HS-7-01742

ACKNOWLEDGMENT: NTIS
ORDER FROM: NTIS   PB80-213176

318967

COST ANALYSIS FOR UPGRADED PASSENGER CAR REAR SIGNAL LIGHTING REQUIREMENTS

A production cost analysis was performed on four candidate vehicle rear signal lighting system upgrades. The systems studied were: (1) A high-mounted brake (stop) lamp only; (2) A deceleration signal only; (3) Combination of high-mounted brake lamp and the deceleration signal; and a (4) Mandatory yellow (amber) rear turn signal lamp. The specific performance levels for the systems were established and the necessary changes in vehicle hardware were determined. Two of each market size class of vehicles were selected for design studies and quarter-scale design layouts of the vehicle modifications were made. Using standard production cost estimating techniques, the consumer costs of each of the four upgraded systems were estimated. Assuming any upgraded rear lighting requirements to become effective on 1983 models, the effects of leadtime on the manufacturers is discussed. The effects on fuel operating and maintenance costs are considered.

McLean, RF   Wakeley, H   Viergutz, OJ
IIT Research Institute, National Highway Traffic Safety Administration   Final Rpt. IITRI-T6009-T05, HS-805 489, Mar. 1980, 98p
Contract DOT-HS-9-02112

ACKNOWLEDGMENT: NTIS
ORDER FROM: NTIS   PB80-219728

318976

DESIGN AND COST ANALYSIS OF TRUCK/TRAILER REAR-UNDERRIDE GUARDS

The study examined the need for increased protection of large trucks and trailers against passenger care underride during rear end collisions. An analysis was performed of: the use characteristics of large trucks and trailers over 10,000 lbs. GVW; the configuration of current underride guard devices; and the design changes, cost and user impact that would result if improved safety requirements were imposed. Results indicated that the greatest potential underride hazard exists for vans and flat bed vehicles, particularly semi-trailers with sliding tandem axles in the forward position. Of the 545,000 newly registered large straight trucksand trailers in 1978, 260,000 are potential rear underride hazards. Four underride guard designs weighs less than 300 lbs., requires minimal vehicle modification, imposes no restrictions on rear axle slider position, and may be constructed of low cost standard structural steel. Unit cost is estimated at less than $200 over new vehicle purchase price. Ground clearance and weight of the proposed new guard would have minimal impact on user revenues, fuel cost, and loading and docking operations.

Taylor, TJ   Ludtke, NF
Corporate-Tech Planning, Incorporated, National Highway Traffic Safety Administration   Final Rpt. HS-805 483, Mar. 1980, 139p
Prepared in cooperation with Pioneer Engineering and Mfg. Co., Inc., Warren, MI.
Contract DOT-HS-9-02110

ACKNOWLEDGMENT: NTIS
ORDER FROM: NTIS   PB80-221203

318980

A REVIEW OF MOTORCYCLE CRASH BARS AND THEIR ROLE IN INJURY PREVENTION

The study reviewed the status of motorcycle crash bars with emphasis on their possible effectiveness in preventing injuries to motorcycle riders. A literature search and review was undertaken. Manufacturers data on crash bars and motorcycles were assembled. The review of accident data indicates that lower leg injuries may have serious disabling consequences for the victim. Possible effectiveness of production crash bars in reducing the severity of these injuries cannot be determined from the present data base. Several research studies related to motorcycle safety were also reviewed. Performance data on production crash bars are not available in the literature. Results for experimental injury countermeasure devices for motorcycles intended to provide improved lateral protection to riders do not appear to be applicable to current production crash bars. Because of information voids in several areas, it is presently not possible to assess the possible effectiveness of production motorcycle crash bars.

Miller, PM Arendt, RH
MGA Research Corporation, National Highway Traffic Safety Administration Final Rpt. G9-004, HS-805 486, May 1980, 152p
Contract DOT-HS-8-01936

Acknowledgment: NTIS
Order From: NTIS PB80-223415

318982

DRUG RESEARCH METHODOLOGY. VOLUME III. THE DETECTION AND QUANTITATION OF DRUGS OF INTEREST IN BODY FLUIDS FROM DRIVERS

The report presents the findings of a workshop on the chemical analysis of body fluids for drugs of interest in highway safety. A cross-disciplinary panel of experts reviewed the list of drugs of interest developed in a previous workshop and described an analytical perspective with which to address issues related to their detection and quantitation. Also summarized in the report are discussions of issues in the design of hihway safety research involving drug analysis--the collection, handling, and storage of body fluid specimens; monitoring the quality of analytical results (proficiency testing of laboratories and quality control procedures); interpretation of analytical results, including collateral data needed for interpretation of findings; and the design of surveys of drug use among drivers.

Joscelyn, KB Donelson, AC
Highway Safety Research Institute, National Highway Traffic Safety Administration Final Rpt. UM-HSRI-80-18, HS-805 375, Mar. 1980, 78p

Rept. for 1976-1980. Vol. 1 is HS-805 374; Vol. 2 is HS-805 299; Vol. 4 is HS-805 485; and Vol. 5 is HS805 462. See also HS-803 879 and HS-805 461.
Contract DOT-HS-7-01530

Acknowledgment: NTIS
Order From: NTIS PB80-223530

318983

DRUG RESEARCH METHODOLOGY. VOLUME IV. EPIDEMIOLOGY IN DRUGS AND HIGHWAY SAFETY: THE STUDY OF DRUG USE AMONG DRIVERS AND ITS ROLE IN TRAFFIC CRASHES

The report presents the findings of a workshop on epidemiology in drugs and highway safety. A cross-disciplinary panel of experts (1) identified methodological issues and constraints present in research to define the nature and magnitude of the drug and driving problems; and (2) outlined approaches to the design and conduct of surveys to estimate the highway safety risk attributable to the use of drugs other than alcohol alone. Participants addressed specific topic areas in the context of two general issues--(1) the sequence of research needed to establish drugs other than alcohol as a priority concern in highway safety; and (2) the relationship of data provided by different types of surveys and information required for policy decisions.

Joscelyn, KB Donelson, AC
Highway Safety Research Institute, National Highway Traffic Safety Administration Final Rpt. UM-HSRI-80-19, HS-805 485, June 1980, 80p

Vol. 1 is HS-805 374; Vol. 2 is HS-805 299; Vol. 3 is HS-805 375; and Vol. 5 is HS-805 462. See also HS-803 879 and HS-805 461.
Contract DOT-HS-7-01530

Acknowledgment: NTIS
Order From: NTIS PB80-223548

318984

DRUG RESEARCH METHODOLOGY. VOLUME V. EXPERIMENTATION IN DRUGS AND HIGHWAY SAFETY: THE STUDY OF DRUG EFFECTS ON SKILLS RELATED TO DRIVING

The report presents the findings of a workshop on experimental research in the area of drugs and highway safety. Complementing studies of drug use in different driving populations, experimentation here refers to studies performed under controlled conditions, usually in a laboratory setting, to measure the effects of drugs on skills related to driving. A cross-disciplinary panel of experts examined methodological approaches used to assess the potential of drugs to increase the likelihood of traffic crashes (risk potential). The report summarizes discussions of specific issues in experimental drug and driving research, including the relationships between the concentration of drugs in body fluids and their effects on behavior; comparability of experimental findings among different studies; the use of alcohol as a standard reference drug in experimental research, and the proper selection of experimental subjects for drug and driving research.

Joscelyn, KB Donelson, AC
Highway Safety Research Institute, National Highway Traffic Safety Administration Final Rpt. UM-HSRI-80-20, HS-805 462, June 1980, 69p

Vol. 1 is HS-805 374; Vol. 2 is HS-805 299; Vol. 3 is HS-805 375; Vol. 4 is HS-805 485. See also HS-803 879 and HS-805 461.
Contract DOT-HS-7-01530

Acknowledgment: NTIS
Order From: NTIS PB80-223555

318989

DRUGS AND HIGHWAY SAFETY 1980

The report presents findings of a study to describe (1) present knowledge about the relationship between drug use by drivers and highway safety, and (2) efforts to detect and prevent drug-impaired driving. Past, ongoing, and planned activities at federal, state, and local levels are identified, including research to define the nature and magnitude of the drug and driving problem and actions to reduce the incidence of drug-impaired driving. An overview of drugs and highway safety summarizes the present state of knowledge and discusses the alcohol-highway safety experience in relation to other drugs. Studies of drug effects on measures of driving performance and surveys of drug use among drivers are then reviewed. Also reviewed are the state of the art and current applications of techniques to detect and measure drugs in body fluids of drivers. The treatment of laws relevant to drugs and driving includes a detailed comparison of state laws dealing with drug-impaired driving, their application and limitations. Enforcement, adjudication, and sanctioning practices are described. Specific examples of other countermeasure approaches, including information and education campaigns, are presented.

Joscelyn, KB Donelson, AC Jones, RK McNair, JW Ruschmann, PA
Highway Safety Research Institute, National Highway Traffic Safety Administration Final Rpt. UM-HSRI-80-5, HS-805 461, May 1980, 267p

See also HS-803 879, HS-805 299, HS-805 374, HS-805 375, HS-805 462, and HS-805 485.
Contract DOT-HS-7-01530

Acknowledgment: NTIS
Order From: NTIS PB80-224397

319852

A COMPARISON OF ALCOHOL INVOLVEMENT IN PEDESTRIANS AND PEDESTRIAN CASUALTIES

A field accident research study was conducted in New Orleans, Louisiana in 1975-1976 in order to determine the percentage and relative risk of alcohol involvement in adult pedestrian fatal and injury accidents; to identify in the alcohol-involved accidents any unique accident types, behavioral errors, or other characteristics; and to study the alcohol use patterns and drinker classifications of these pedestrians. Data were collected on pedestrian (age 14 and over) accident cases, and control groups were established. Positive blood alcohol concentrations (BAC's) were found in approximately half of both the fatally injured and nonfatally injured pedestrian groups. The outcome indicates that the degree of alcohol involvement in nonfatal crashes is as great as in fatal accidents and that a startling proportion of victims in both groups have very high BAC's. Depending upon the control group used, the relative risk of accident involvement increases at BAC's greater than or equal to .10% and accelerates rapidly at higher levels. There were indications that the path the pedestrian chose in crossing the road, the culpability of the pedestrian, and the frequency of the pedestrian striking the vehicle were related to the pedestrian's BAC. Areas for future research and potential countermeasures were identified.

Blomberg, RD Fell, JC Anderson, TE (Dunlap and Associates, Incorporated)
Dunlap and Associates Incorporated, National Highway Traffic Safety Administration HS-805 521, Oct. 1979, 20p, 14 Ref.

Presented at the 23rd Conference of American Assoc for Automotive Medicine, Louisville, Kentucky, 4-6 October 1979 (appears in Proceedings).
Contract DOT-HS-0-00946

Acknowledgment: National Highway Traffic Safety Administration
Order From: NTIS

326021

SAFETY AND MOBILITY ISSUES IN LICENSING AND EDUCATION OF OLDER DRIVERS

The program had as its intent the study of older drivers in private automobiles, their driving behavior, and their safety and mobility. The study covered a problem identification and assessment process followed by the subsequent adaption of the information gathered into mechanisms and suggestions for improvement of the safe mobility of older drivers. Through intensive review of previous research, consultation with other experts, new analyses of existing data bases and experimentation, driving problems and behaviors were described. Older drivers (55 or 65) have, at least, equal and probably fewer accidents per driver than any younger age group. Drivers, beginning around 65 and older have more accidents per mile driven than drivers 25-44. Failure to yield right of way, failure to obey signs and signals, turning at intersections (particularly left), inattention, medical impairments, and alcohol are all significant factors in accidents. As a result of this investigation of driving problems, assistance was provided for an older driver education program; a textbook and license renewal manual for older drivers was produced and a model older driver licensing and improvement system was developed.

Brainin, PA
Dunlap and Associates, Incorporated, National Highway Traffic Safety Administration   Final Rpt.   ED-80-3, HS-805 492, Feb. 1980, 223p
Contract DOT-HS-7-01502

Acknowledgment: NTIS
Order From: NTIS   PB80-213184

326023

MOBILE PARAMETRIC MEASUREMENT DEVICE. VOLUME I: OPERATION. (USERS MANUAL)

The objective of this program was to design, construct, and validate a mobile device for measuring vehicle parameters necessary for an accurate prediction of the vehicle's handling characteristics. As a result of this program, a Mobile Parametric Measurement Device (MPMD) was constructed, and test procedures validated. The report is of three users manuals--Volume I, Operation; Volume II, Test Procedures; maintenance), test procedures, and data reduction procedures of the MPMD.

Thatcher, C
Dynamic Science, Incorporated, National Highway Traffic Safety Administration   8309-80-026/1613, HS-805 477, Jan. 1980, 60p
Also available in Volume II, PB80-213697, Volume III, PB80-213697, Volume III, PB80-213705. Also available in set of 3 reports PC E08, PB80-213671.
Contract DOT-HS-6-01413

Acknowledgment: NTIS
Order From: NTIS   PB80-213689

326024

MOBILE PARAMETRIC MEASUREMENT DEVICE. VOLUME II: TEST PROCEDURES. (USERS MANUAL)

The objective of this program was to design, construct, and validate a mobile device for measuring vehicle parameters necessary for an accurate prediction of the vehicle's handling characteristics. As a result of the program, a Mobile Parametric Measurement Device (MPMD) was constructed, and test procedures validated.

Thatcher, C
Dynamic Science, Incorporated, National Highway Traffic Safety Administration   8309-80-026/1613-V2, HS-805 478, Jan. 1980, 97p
Vol. 1 is HS-805 477; Vol. 3 is HS-805 479. Also available in set of 3 reports PC E08, PB80-213671.
Contract DOT-HS-6-01413

Acknowledgment: NTIS
Order From: NTIS   PB80-213697

326025

MOBILE PARAMETRIC MEASUREMENT DEVICE. VOLUME III: DATA REDUCTION PROCEDURES. (USERS MANUAL)

The objective of this program was to design, construct, and validate a mobile device for measuring vehicle parameters necessary for an accurate prediction of the vehicle's handling characteristics. As a result of the program, a Mobil Parametric Measurement Device (MPMD) was constructed, and test procedures validated.

Thatcher, C
Dynamic Science, Incorporated, National Highway Traffic Safety Administration   8309-80-026/1613-V3, HS-805 479, Jan. 1980, 42p
Vol. is HS-805 477; Vol. 2 is HS-805 478. Also available in set of 3 reports PC E08, PB80-213671.
Contract DOT-HS-6-01413

Acknowledgment: NTIS
Order From: NTIS   PB80-213705

326030

DRIVER VISIBILITY QUALITY: COMPARISON OF VISIBILITY QUALITY METER DATA WITH HUMAN VISUAL PERFORMANCE

The objective of this investigation was to calibrate the performance of a Visibility Quality Meter (VQM) against a measure of human contrast perception. The VQM quantifies a meaningful aspect of driver visibility quality, modulation transfer. Data were collected from 28 volunteers who represented younger and older United States driving populations. Various simulations of driving-related optical degradation (fogged and iced windshields) were interposed between a subject or the VQM and a visual target. The calibration took the form of qualitative and quantitative comparisons of VQM to human modulation across a wide range of spatial frequencies for the different degradation conditions.

Merritt, JO   Miller, JC   Kerr, SK
Human Factors Research, Incorporated, National Highway Traffic Safety Administration   Final Rpt.   HFR-TR-2714, HS-805 496, May 1980, 61p
Contract DOT-HS-8-02050

Acknowledgment: NTIS
Order From: NTIS   PB80-215312

326032

ACCIDENT AVOIDANCE SKILL TRAINING

New equipment and techniques for training drivers to avoid crashing following imminent threats from both unmoving objects and other moving automobiles were developed and applied. Sixteen students, ranging from newly licensed teenagers to adults with more than five years of driving experience, were exposed to the realistic crash avoidance experience provided by the new equipment and techniques on a driving range. Initial differences were noted between the beginning drivers and the experienced adults in their respective abilities to avoid crashes. Before leaving the program, however, the drivers of each age and experience subgroup had become significantly better and about equal in their ability to escape the imminent danger faced. More encouraging was that all the students retested nine months after training not only had retained the crash avoidance skills developed, they improved them.

Bathurst, JR
Essex Corporation, National Highway Traffic Safety Administration   Final Rpt.   HS-805 480, Mar. 1980, 125p
Contract DOT-HS-7-01547

Acknowledgment: NTIS
Order From: NTIS   PB80-215924

326038

TEST DEVICE AND TEST PROCEDURE TO ASSESS SIDE STRUCTURES, PHASE I--FINAL REPORT

The purpose of this report is to document the results of studies and tests performed under Phase I of the Side Structures Evaluation program. This contract involves the development of a test device which will simulate the effect of a bullet car in car-to-car side impacts. The test device described herein consists of a layered aluminum honeycomb energy-absorbing (E/A) face mounted on a wheeled bogey vehicle. The stiffness and geometry of the E/A face are based upon weighted averages of test data and frontal geometric characteristics of a representative selection of late-model cars.

Three series of crash tests were conducted, along with a series of static honeycomb component tests. The crash tests were conducted to provide frontal stiffness data, to measure the E/A face stiffness, and to compare the effect of the Side Impactor with that of a bullet car in car-to-car side impacts.

Beharrell, J Johnson, N Davis, S
Dynamic Science, Incorporated, National Highway Traffic Safety Administration HS-805 491, June 1980, 396p
Contract DOT-HS-8-01933

Acknowledgment: NTIS
Order From: NTIS PB80-217896

326058

LIGHT DUTY TRUCK WEIGHT REDUCTION EVALUATION

This contract covers the identification of Types, Makes and Models which constitute the Light Truck world fleet. The attributes which describe the critical functional aspects of trucks of this size are established and specifications to define the attributes obtained. Methods of comparison of attributes are developed to provide a means of comparison leading to the selection of the most efficient design for each type vehicle. The potential for reduction of function is also evaluated. The weight reduction potential for each selected vehicle type is determined based on size reduction, redesign and material substitution methods. Based on the preceding Product Dependent Weight reductions, related reductions in Power and Weight Dependent weights are determined to provide a total weight reduction potential. Effects of the weight reduction are provided.

Ludtke, NF
Pioneer Engineering and Manufacturing Company Inc, Transportation Systems Center, National Highway Traffic Safety Administration Final Rpt. DOT-TSC-NHTSA-80-6, HS-805 459, Aug. 1980, 205p
Contract DOT-TSC-1451

Acknowledgment: NTIS
Order From: NTIS PB80-224132

326060

AUTOMOBILE FUELS AND FUEL ECONOMY

This bibliography represents literature on the subject of fuels which has been acquired since the establishment of the National Highway Traffic Safety Administration.

Flynn, L
National Highway Traffic Safety Administration Bibliog. SB-43, HS-805 466, July 1980, 190p

Acknowledgment: NTIS
Order From: NTIS PB80-224884

326069

PASSENGER VEHICLE TIRE INSPECTION EQUIPMENT. VOLUME I. SUMMARY

A nondestructive tire carcass integrity testing technique that is based upon mechanical vibration principles is verified. The testing methodology has been incorporated into a prototype machine capable of performing on-vehicle inspection. Also, a temperature compensated inflation device has been developed that can actually determine what volume of air must be either injected or bled from a tire such that the tire will exhibit a specified cold pressure. This report is composed of two volumes--Volume I, Summary and Volume II, Technical Report.

Johnson, JE Charbonnet, CR
Southwest Research Institute, National Highway Traffic Safety Administration Final Rpt. SWRI-02-5080, HS-805 515, Oct. 1979, 20p
See also HS-805 516 and HS-805 517.
Contract DOT-HS-7-01693

Acknowledgment: NTIS
Order From: NTIS PB80-226228

326070

PASSENGER VEHICLE TIRE INSPECTION EQUIPMENT. VOLUME II. TECHNICAL REPORT

A nondestructive tire carcass integrity testing technique that is based upon mechanical vibration principles is verified. The testing methodology has been incorporated into a prototype machine capable of performing on-vehicle inspection. Also, a temperature compensated inflation device has been developed that can actually determine what volume of air must be either injected or bled from a tire such that the tire will exhibit a specified cold pressure.

Johnson, JE Charbonnet, CR
Southwest Research Institute, National Highway Traffic Safety Administration Final Rpt. SWRI-02-5080-V2, HS-805 516, Oct. 1979, 75p
See also Summary Report, HS-805 515; also HS-805 517.
Contract DOT-HS-7-9693

Acknowledgment: NTIS
Order From: NTIS PB80-226236

326250

NCSS (NATIONAL CRASH SEVERITY STUDY) STATISTICS: LIGHT TRUCKS AND VANS

This document has been prepared from a subset of the National Crash Severity Study data restricted to light trucks and vans involved in sampled accidents. The report is a supplement to the NCSS Statistics: Passenger Cars dated June 1980. The National Crash Severity Study (NCSS) is a major accident data collection program of the National Center for Statistics and Analysis (NCSA) of the National Highway Traffic Safety Administration (NHTSA). Data collection began in January 1977 and terminated in March 1979. This report presents tabulations of the data for the last twelve months of the study, thus covering the period April 1, 1978 through March 31, 1979. Accidents were investigated in seven geographic areas within the continental United States selected so that the aggregate of the areas closely resembles the urbanization distribution of the entire country. Within each area a stratified sampling plan was used to gather detailed information on passenger cars, light trucks, and vans (and their occupants) in crashes which were severe enough to require that the vehicles be towed from the scene. The combined investigations presented here total 905 crashes, 951 towed light trucks and vans, 1,608 case vehicle occupants, and 104 fatalities. The tables in this report represent only a very broad treatment of the data.

Ricci, LL
Highway Safety Research Institute, National Highway Traffic Safety Administration UM-HSRI-80-37, HS-805 530, June 1980, 98p
See also HS-805 531.
Contract DOT-HS-8-01944

Acknowledgment: NTIS
Order From: NTIS PB80-216534

326251

AN ANALYSIS OF THE POTENTIAL LEGAL CONSTRAINTS ON THE USE OF MECHANICAL DEVICES TO MONITOR DRIVING RESTRICTIONS

An analysis was made of the potential legal constraints on the use of mechanical devices to supervise drinking and driving restrictions. These conceptual devices would be installed on vehicles operated by restricted drivers. Two devices contain psychomotor tests and are designed to prevent driving during prohibited times of the day. Analysis of current law revealed that the proposed devices would be a constitutional means of enforcing drinking and driving restrictions. Methods for use of the devices that will resolve other possible legal constraints are presented.

Ruschmann, PA Carroll, HO Greyson, M Joscelyn, KB
Highway Safety Research Institute, National Highway Traffic Safety Administration Final Rpt. UM-HSRI-79-95, HS-805 523, Sept. 1979, 62p
Contract DOT-HS-7-01536

Acknowledgment: NTIS
Order From: NTIS PB80-216542

326252

AN ANALYSIS OF THE LEGAL FEASIBILITY OF IMPOSING OWNER LIABILITY FOR MOVING TRAFFIC VIOLATIONS

An analysis was made of the legal feasibility of a proposed owner-liability countermeasure. Under this countermeasure, a vehicle owner could be held civilly liable for speeding and other minor moving traffic violations committed by a driver using the vehicle with permission. The approach underlying the owner-liability countermeasure is similar to that used to enforce parking regulations. Relevant constitutional provisions, legislation, and court decisions dealing with holding individuals responsible for the actions of others, were analyzed. Analysis of current law revealed that some forms of legislation imposing liability on owners of vehicles driven in violation of traffic laws likely would be upheld by courts as constitutional.

To be upheld, however, owner-liability legislation could impose only small, civil penalties (similar to parking fines), but could not impose jail sentences, license suspensions, or violation points on owners. In addition, analysis of legislation in other areas of traffic law revealed that the proposed owner-liability countermeasure might encounter public opposition; if such opposition were to develop, it could influence legislative willingness to enact owner-liability legislature.

Ruschmann, PA Greyson, M Carroll, HO Joscelyn, KB
Highway Safety Research Institute, National Highway Traffic Safety Administration Final Rpt. UM-HSRI-79-63, HS-805 526, Sept. 1979, 25p
Contract DOT-HS-7-01536

Acknowledgment: NTIS
Order From: NTIS PB80-216559

326256

CONSUMER ACCEPTANCE OF RSV (RESEARCH SAFETY VEHICLE) FEATURES. VOLUME I: EXECUTIVE SUMMARY

This report covers findings from a series of 23 focus panels among consumers in six U.S. cities, researching attitudes and opinions about safety features of the Minicars' Research Safety Vehicle.

Henderson, NH Curran, KN
Prism Corporation, National Highway Traffic Safety Administration Final Rpt. HS-805 454, June 1980, 11p
See also Vol 2, HS-805 455, PB80-217839.
Contract DTNH-22-80-C-07268

Acknowledgment: NTIS
Order From: NTIS PB80-217821

326257

CONSUMER ACCEPTANCE OF RSV (RESEARCH SAFETY VEHICLE) FEATURES. VOLUME II: COMPREHENSIVE REPORT ON 23 FOCUS GROUPS TO INVESTIGATE CONSUMER ACCEPTANCE OF RESEARCH SAFETY VEHICLE FEATURES

This report covers findings from a series of 23 focus panels among consumers in six U.S. cities, researching attitudes and opinions about safety features of the Minicars' Research Safety Vehicle.

Henderson, NH Curran, KN
Prism Corporation, National Highway Traffic Safety Administration Final Rpt. HS-805 455, June 1980, 83p
See also Vol 1, HS-805 454, PB80-217821.
Contract DTNH-22-80-C-07268

Acknowledgment: NTIS
Order From: NTIS PB80-217839

326259

AN ANALYSIS OF THE POTENTIAL LEGAL CONSTRAINTS ON PROPOSED MODEL LEGISLATION CREATING A CLASS OF TRAFFIC OFFENSES AGGRAVATED BY ALCOHOL

An analysis was made of the legal feasibility of proposed legislation intended to deal with drinking drivers who do not meet the legal standard for alcohol intoxication, but who commit hazardous traffic violations while their blood alcohol concentration (BAC) is high enough to increase the risk of traffic crash involvement. The combination of alcohol involvement and a hazardous violation would be classified as a traffic offense aggravated by alcohol. Convicted offenders would receive increased sanctions, alternative sanctions (such as mandatory attendance at an alcohol-education program), or both. Examination of current law revealed that the proposed legislation would be constitutional in principle. However, chemical testing of drivers could be compelled only if there existed probable cause to arrest for a drinking-driving offense. In addition, enacting the proposed legislation would require substantial changes in existing state implied-consent and drinking-driving laws; for that reason, practical and potential constraints might be encountered.

Ruschmann, PA Joscelyn, KB
Highway Safety Research Institute, National Highway Traffic Safety Administration Final Rpt. UM-HSRI-79-61, HS-805 522, Sept. 1979, 37p
Contract DOT-HS-7-01536

Acknowledgment: NTIS
Order From: NTIS PB80-222060

326260

AN ANALYSIS OF THE POTENTIAL LEGAL CONSTRAINTS ON THE USE OF SPEED MEASURING DEVICES

An analysis was made of the potential legal constraints on the use of existing and proposed devices for measuring vehicle speeds. Some of the proposed devices are remote in nature and would operate without a police officer being present. Examination of current law reveals that existing devices, especially radar devices, for the most part face no substantial constraints. However, the use of such devices as VASCAR and stop watches, which are based on time-distance measurements, are prohibited by law in a few states. The use of proposed remote-observation devices is constrained by laws governing speed prosecutions; the chief constraint is that to obtain a conviction, driver must be personally identified and proved responsible.

Ruschmann, PA Greyson, M Joscelyn, KB
Highway Safety Research Institute, National Highway Traffic Safety Administration Final Rpt. UM-HSRI-79-62, HS-805 524, Sept. 1979, 40p
Contract DOT-HS-7-01536

Acknowledgment: NTIS
Order From: NTIS PB80-222078

326261

RELATIONSHIP BETWEEN TRUCK RIDE QUALITY AND SAFETY OF OPERATIONS: METHODOLOGY DEVELOPMENT

This report presents an overall program plan, including sample experimental design, which can be used to determine the effects of vehicle vibration upon driver performance. The recommended solution is to combine a fixed-base driving simulator facility with a high-frequency motion base "ride quality" facility. The result is an interactive "rider simulator" that allows line drivers to perform real-world tasks while under very tightly controlled traffic and vibration scenarios. This approach has never been attempted before. Ride simulator facilities that meet the necessary requirements exist, and the driving simulator capability also exists at several research organizations throughout the U.S. The motion and driving task facilities could be brought together in about one year's time to the point of being ready to provide: an instrumented truck cab mounted on motion base and tied into a computer facility; various levels of cab acceleration data "measured" from variou trucks on both rough and smooth roads; and various driving scenarios. This simulator phase would require a minimum of 18 line driver subjects and should take about three months (including data analysis) to complete. When added to one year's preparation and three months for final report preparation, the overall program could be accomplished in about 18 months. The results of this study, if implemented by the NHTSA via subsequent procurement actions, would be used to determine if rulemaking standards for truck ride quality are warranted.

Klein, RH Allen, RW Miller, JC
Systems Technology, Incorporated, National Highway Traffic Safety Administration Final Rpt. SRI-TR-1155-1, HS-805 494, 1980, 189p
Contract DOT-HS-9-02310

Acknowledgment: NTIS
Order From: NTIS PB80-224108

326263

THE IMPACT OF AUTOMOTIVE FUEL ECONOMY STANDARDS ON COMPETITION IN THE AUTOMOTIVE INDUSTRY

This report analyzes market demand for automobile attributes, including those that are likely to be affected by fuel economy improvements, and presents estimates of dollar market valuations of key attributes. Market share effects of various assumed changes in car prices are analyzed in order to gain insight into competition among car models and the sensitivity of new car fleet average fuel economy to possible manufacturer or size-class-specific pricing strategies. Effects of gasoline price changes are also analyzed.

Boyd, JH Mellman, RE
Charles River Associates, Incorporated, National Highway Traffic Safety Administration Final Rpt. CRA-391, HS-805 528, July 1980, 259p
Contract DOT-HS-7-01786

Acknowledgment: NTIS
Order From: NTIS PB80-224991

Highway Safety Literature

326264

GENERAL LEGAL CONSIDERATIONS RELEVANT TO HIGHWAY SAFETY COUNTERMEASURE DEVELOPMENT AND IMPLEMENTATION

An analysis is made of the general constitutional, statutory, and judicially imposed limits on the power of government to make and enforce laws prohibiting unsafe driving behavior in general and to implement specific countermeasures. Essential principles of the American legal system--including the impact of constitutional provisions, elements of the criminal, civil, and administrative law system, and the methodology by which courts resolve legal disputes--were outlined. Specific legal principles addressed in this document include: the requirement of substantive and procedural due process of law; the guarantee of equal protection of the laws; the prohibition against unreasonable arrests, searches, and seizures; the privilege against compelled self-incrimination; and constitutional, statutory, and common-law privacy rights. The rights of probationers, and other persons convicted of or charged with traffic offenses, are also discussed.

Ruschmann, PA Greyson, M McNair, JW Joscelyn, KB
Highway Safety Research Institute, National Highway Traffic Safety Administration Final Rpt. UM-HSRI-79-73, HS-805 525, Oct. 1979, 264p
Contract DOT-HS-7-01536

Acknowledgment: NTIS
Order From: NTIS PB80-226012

326318

FRICTION TESTS OF A CHRYSLER 1978, 225 CID ENGINE

This document reports tests on a 1978 Chrysler, 225 CID, six-cylinder engine to determine the losses due to friction and accessories. The tests were conducted at the Automotive Research laboratory of the Transportation Systems Center with the engine attached to the dynamometer. The latter is programmable to measure either power output or power absorption. Graphs of the results are presented.

Gagne, G Bell, M Walter, R
Transportation Systems Center, National Highway Traffic Safety Administration Final Rpt. DOT-TSC-NHTSA-80-14, HS-805 487, Sept. 1980, 20p

Acknowledgment: NTIS
Order From: NTIS PB81-104515

326349

NCSS STATISTICS: PASSENGER CARS

The National Crash Severity Study (NCSS) is a major accident data collection program of the National Center for Statistics and Analysis (NCSA) of the National Highway Traffic Safety Administration (NHTSA). Data collection began on January 1, 1977 and terminated on March 31, 1979. This report presents tabulations of accidents involving towed passenger cars for the entire twenty-seven month period. Accidents were investigated in seven geographic areas within the continental United States selected so that the aggregate of the areas closely resembles the urbanization distribution of the entire country. Within each area, a stratified sampling plan was used to gather detailed information on passenger cars in accidents severe enough to require that the vehicles be towed from the scene. The combined investigations presented here total 11,386 accidents, 14,805 towed vehicles, 24,976 vehicle occupants, and 917 fatalities. The tables and figures in this report were generated using computer files for a passenger car subset of the NCSS data, and represent only a very broad treatment of the data.

Ricci, LL
Highway Safety Research Institute, National Highway Traffic Safety Administration UM-HSRI-80-36, HS-805 531, June 1980, 110p
See also HS-805 530.
Contract DOT-HS-8-01944

Acknowledgment: NTIS
Order From: NTIS PB81-103400

326379

EMERGENCY MEDICAL SERVICES HIGHWAY SIGN EVALUATION

The document identifies the needs for a highway sign that will announce significant points or methods of access to the Emergency Medical Services system within the emergency response system. Further, the document validates the use of the "Star of Life" symbol to meet these needs.

Smith, MJ Ware, AS
Pabon, Sims, Smith and Associates, National Highway Traffic Safety Administration Final Rpt. HS-805 529, Apr. 1980, 143p
Contract DOT-HS-9-02219

Acknowledgment: NTIS
Order From: NTIS PB81-109431

326410

DRUGS AND DRIVING: A SELECTED BIBLIOGRAPHY. SUPPLEMENT THREE

The report presents an annotated bibliography of literature to drugs and highway safety. This volume is the fourth of a series of bibliographic reports, and is intended as a resource document. Its purpose is to aid current efforts in determining the relationship of drugs and highway safety. The primary objective is the presentation of literature, not the analysis of research. The contents of the report are representative, but not inclusive, of the available literature.

Veldkamp, MB Donelson, AC Joscelyn, KB
Highway Safety Research Institute, National Highway Traffic Safety Administration Final Rpt. UM-HSRI-80-46, HS-805 519, June 1980, 445p
The parent volume is HS-802 188; Supp. 1 is HS-803 879; Supp. 2 is HS-805 520.
Contract DOT-HS-7-01530

Acknowledgment: NTIS
Order From: NTIS PB81-111817

326411

DRUGS AND DRIVING: A SELECTED BIBLIOGRAPHY. SUPPLEMENT TWO

The report presents a bibliography of literature dealing primarily with the relationship of drug use (other than alcohol alone) and highway safety. This volume is the third of a series of annotated bibliographies designed to provide ready access to archival, technical, and popular publications. This supplement updates previous bibliographic reports and continues coverage of research areas that support the development and application of methods to study the drug and driving problem. This report provides a detailed description of the scope and method of the literature search and review effort that resulted in this compilation. The bibliography consists of four appendices, including a Tropical Index, an Author Index, a Title Index, and an Abstract Index, which contains approximately six hundred abstracts of the selected publications. A revised topical index provides access to abstracts according to type of publication, area of drug and driving research, methods applied in research on drugs and highway safety, drugs and classes of drugs. Within the topical index, drugs are cross-indexed by generic and trade names. A drug classification scheme is provided.

Veldkamp, MB Donelson, AC Joscelyn, KB
Highway Safety Research Institute, National Highway Traffic Safety Administration Final Rpt. UM-HSRI-80-45, HS-805 520, June 1980, 446p
The parent volume is HS-802 188; Supp 1 is HS-803 879; Supp. 3 is HS-805 519.
Contract DOT-HS-7-01530

Acknowledgment: NTIS
Order From: NTIS PB81-111825

326416

VEHICLE/WEIGHT COST OPTIMIZATION

The purpose of the study was the development of a computerized mathematical optimization tool to be used in the determination of weight and cost tradeoffs through materials substitution in the design of passenger cars and light trucks. The model determines the minimum cost materials mix for specified weight constraints as well as the relative proportion of each material use in the vehicle as a function of desired percentage weight reduction.

Abram, P Clyne, F Viergutz, OJ
IIT Research Institute, National Highway Traffic Safety Administration Final Rpt. HS-805 513, July 1980, 88p
Prepared in cooperation with ECON, Inc., Princeton, NJ.
Contract DOT-HS-9-02112

Acknowledgment: NTIS
Order From: NTIS PB81-113722

326429

BASELINE FUEL ECONOMY AND EMISSIONS TESTS OF A CHRYSLER 1978, 225 CID ENGINE

This document reports on baseline engine tests of a Chrysler 1978, 225 CID, six-cylinder engine. The tests were conducted in the Automotive Research Laboratory at the Transportation Systems Center. Test results presented herein are also filed on computer-based tapes (9-track ASC II).

Gagne, G Bell, M Walter, R

Transportation Systems Center, National Highway Traffic Safety Administration Final Rpt DOT-TSC-NHTSA-80-15, HS-805 488, Sept. 1980, 46p

ACKNOWLEDGMENT NTIS
ORDER FROM NTIS PB81-105819

326432

SUPPORT FOR THE ANALYTICAL TOOLS FOR AUTOMOTIVE FUEL ECONOMY ACTIVITIES

Vehicle certification reports are issued by EPA in September (preliminary) and February (final) of each year. These reports contain individual emissions test results. The reports also contain vehicle test weight, engine displacement, dynamometer horsepower setting and fuel economy as computed from the emissions values. The certification data have been extracted on magnetic tape.

Hatch, WE

Automated Sciences Group, Incorporated, National Highway Traffic Safety Administration Final Rpt. ASG-TR-80-31, HS-805 518, June 1980, 78p
Contract DOT-HS-7-01708

ACKNOWLEDGMENT NTIS
ORDER FROM NTIS PB81-109555

326433

INSPECTION, MAINTENANCE AND REPAIR OF MOTOR VEHICLES

This bibliography represents literature concerning the inspection, maintenance and repair of motor vehicles which has been acquired since the establishment of the National Highway Traffic Safety Administration in 1967. Citations follow the format used in the monthly abstract journal Highway Safety Literature and are indexed by a key-word-out-of-context (KWOC) listing, author, corporate author, contract number, and report number.

Flynn, L

National Highway Traffic Safety Administration Bibliog. SB-42, HS-805 465, Aug. 1980, 303p

ACKNOWLEDGMENT NTIS
ORDER FROM NTIS PB81-109761

326457

CONTACT LOADS-AN EXPERIMENTAL STUDY. VOLUME I

The objectives of the study were to obtain detailed kinematics of the crash victim during a simulated pedestrian-vehicle collision and to compare these data with the output of a computer simulation using the three-dimensional model developed by Calspan Corp. A total of 10 dummy and 6 cadaver impacts were carried out experimentally. A method for measuring angular acceleration of rigid bodies was developed. Pre-and post-run measurements are also described, including anthropometry, joint properties, static and dynamic force-deflection characteristics and mass moments of inertia of body segments. The Calspan model was used to validate single segment impacts, the drop test carried out by a previous investigator and the full-scale tests made with extensively instrumented surrogates. In general, there was good correlation for both displacement and acceleration. The contact model should be improved for better correlation.

King, AI Padgaonkar, AJ Krieger, KW

Wayne State University, National Highway Traffic Safety Administration Final Rpt. HS-805 498, Oct. 1976, 154p
Cover date is 1980. Vol. 2 is HS-805 499; Vol. 3 is HS-805 500. Also available in set of 3 reports PC E14, PB81-116147.
Contract DOT-HS-146-3-711

ACKNOWLEDGMENT: NTIS
ORDER FROM: NTIS PB81-116154

326458

CONTACT LOADS-AN EXPERIMENTAL STUDY. VOLUME II

A complete and comprehensive quantitative set of experimental simulations of pedestrian-vehicular accidents has been made and is presented in this volume. Body segment kinematics from five dummy and five cadaver runs are recorded. Anthropometric data and inertial data are compiled for four cadavers, two male and two female. Some comparisons of these data with those obtained by other investigators are made to show that the data are reasonable. The force-deflection properties of two types of surface to segment interactions during a pedestrian-vehicle impact are also presented. These results can be used to obtain a better understanding of the contact forces involved during impact as well as the development of better contact models in gross motion simulations. The acceleration data can be utilized to assess the potential sources of impact injuries in a pedestrian accident. Injuries associated with ground impact are compared with those experienced during impact with the vehicle.

King, AI Padgaonkar, AJ Krieger, KW

Wayne State University, National Highway Traffic Safety Administration Final Rpt. HS-805 499, Oct. 1976, 108p
Cover date is 1980. Vol. 1 is HS-805 498; Vol. 3 is HS-805 500 Also available in set of 3 reports PC E14, PB81-116147.
Contract DOT-HS-146-3-711

ACKNOWLEDGMENT: NTIS
ORDER FROM: NTIS PB81-116162

326459

CONTACT LOADS-AN EXPERIMENTAL STUDY. VOLUME III

The experimental data acquired under this contract were primarily intended for the validation of a crash victim simulator (CVS) developed by Calspan Corporation. Volume 3 provides a description of the simulator, discusses the bases for validation and compares model output with experimental data obtained from several different impact conditions.

King, AI Padgaonkar, AJ Krieger, KW

Wayne State University, National Highway Traffic Safety Administration Final Rpt. HS-805 500, Oct. 1976, 145p
Cover date is 1980. Vol. 1 is HS-805 498; Vol. 2 is HS-805 499. Also available in set of 3 reports PC E14, PB81-116147.
Contract DOT-HS-146-3-711

ACKNOWLEDGMENT: NTIS
ORDER FROM: NTIS PB81-116170

328908

LIGHT TRUCK CHARACTERISTICS, HISTORICAL DATA BASE

The report is a description of the data about the physical, operating performance, and market characteristics of light trucks for the model years 1955 through 1977, which is stored on tape in DOT/TSC DEC System 10 computer system. Vehicles are reported by model year and grouped by manufacturer, using production volume, model, body type, engine displacement, transmission and GVWR class attributes as criteria to select representative vehicle configurations. Characteristics are documented for vehicles representative of total U.S. sales of domestic and imported light trucks for the model years indicated.

Cantwell, C

Chilton Company, Idaho State Traffic Safety Commission, National Highway Traffic Safety Administration HS-805 482, Nov. 1980, 65p
See also report dated Dec 79, PB80-145220.
Contract DOT-TSC-1463

ACKNOWLEDGMENT: NTIS
ORDER FROM: NTIS PB81-144388

329138

ECONOMIC STATISTICS AND INFORMATION CONCERNING THE JAPANESE AUTO INDUSTRY

The report examines the following aspects of the Japanese automobile Industry: Identification of Japanese agencies that receive statistical data on the automobile industry; Determination of research and development and capital investment procedures; identification of governmental incentives; and surveys of Japanese economic and business literature.

Saxonhouse, GR

Michigan University, Ann Arbor, Transportation Systems Center, National Highway Traffic Safety Administration Final Rpt. UM-HSRI-79-86, HS-805 481, Dec. 1980, 273p

Contract DOT-TSC-1616
Acknowledgment: NTIS
Order From: NTIS PB81-165482

337124

PASSENGER CAR SPARK IGNITION DATA BASE. VOLUME I: EXECUTIVE SUMMARY

Test data was obtained from spark ignition production and preproduction engines at the engine and vehicle level. The engines were applicable for vehicles 2000 to 3000 pounds in weight. The data obtained provided trade-offs between fuel economy, power, emission constraints and emission control technology, and other relevant parameters.

Oetting, H
Volkswagenwerk AG, Transportation Systems Center, National Highway Traffic Safety Administration Final Rpt. DOT-TSC-NHTSA-79-161, HS-805 456, Dec. 1979, 44p

See also Vol 2 HS-805 457, PB81-166084. Also available in set of 4 reports PC E99, PB81-166068.
Contract DOT-TSC-1269

Acknowledgment: NTIS
Order From: NTIS PB81-166076

337125

PASSENGER CAR SPARK IGNITION DATA BASE. VOLUME II: DISCUSSION AND RESULTS

Test data was obtained from spark ignition production and preproduction engines at the engine and vehicle level. The engines were applicable for vehicles 2000 to 3000 pounds in weight. The data obtained provided trade-offs between fuel economy, power, emission constraints and emission control technology, and other relevent parameters. Volume II, the main body of the report, provides a discussion of the fuel economy and emissions obtained, a description of the engine/vehicle system tested and the results of factory driveability tests.

Oetting, H
Volkswagenwerk AG, Transportation Systems Center, National Highway Traffic Safety Administration Final Rpt. DOT-TSC-NHTSA-79-162, HS-805 457, Dec. 1979, 390p

See also Vol 1, HS-805 456, PB81-166076; Vol 3 (2 parts) HS-805 458, PB81-166092, 166100. Also available in set of 4 reports PC E99, PB81-166068.
Contract DOT-TSC-1269

Acknowledgment: NTIS
Order From: NTIS PB81-166084

337126

PASSENGER CAR SPARK IGNITION DATA BASE. VOLUME III: MISCELLANEOUS DATA, PART I

Test data was obtained from spark ignition production and preproduction engines at the engine and vehicle level. The engines were applicable for vehicles 2000 to 3000 pounds in weight. The data obtained provided trade-offs between fuel economy, power, emission constraints and emission control technology, and other relevent parameters. Volume III, the appendixes, presents miscellaneous data used during the program.

Oetting, H
Volkswagenwerk AG, Transportation Systems Center, National Highway Traffic Safety Administration Final Rpt. DOT-TSCNHTSA-79163-1, HS-805 458, Dec. 1979, 443p

See also Vol 1, HS-805 456, PB81-166076; Vol 2, HS-805 457, PB81-166084; Vol. 3 (2 parts), HS-805 458, PB81-166100 (part 2). Also available in set of 4 reports PC E99, PB81-166068.
Contract DOT-TSC-1269

Acknowledgment: NTIS
Order From: NTIS PB81-166092

337182

PASSENGER CAR SPARK IGNITION DATA BASE. VOLUME III: MISCELLANEOUS DATA, PART II

Test data was obtained from spark ignition production and preproduction engines at the engine and vehicle level. The engines were applicable for vehicles 2000 to 3000 pounds in weight. The data obtained provided trade-offs between fuel economy, power, emission constraints and emission control technology, and other relevent parameters. Volume III, the appendixes, presents miscellaneous data used during the program.

Oetting, H
Volkswagenwerk AG, Transportation Systems Center, National Highway Traffic Safety Administration Final Rpt. DOT-TSCNHTSA-79163-2, HS-805 458, Dec. 1979, 403p

See also Vol 1, HS-805 456, PB81-166076; Vol 2, HS-805-457, PB81-166084; Vol 3 (2 parts), HS-805 458, PB81-166092 (part 1). Also available in set of 4 reports PC E99, PB81-166068.
Contract DOT-TSC-1269

Acknowledgment: NTIS
Order From: NTIS PB81-166100

341118

SUBJECTIVE RESPONSE TO TRAFFIC NOISE RELATED TO OBJECTIVE MEASUREMENTS INSIDE AND OUTSIDE OF DWELLINGS

This report is devoted to the question of finding the most cost-effective way of optimising the control of noise emitted by vehicles in the important urban environment. It considers whether it is realistic to predict the noise level inside a residence from the external measured noise emission. It also examines whether subjective preference for internal noise can be adequately predicted solely from external noise measurements, or whether an alternative approach is required. The study used 28 subjects for pair comparison subjective experiments concerned with noise at the facade and noise indoors. Four urban main-road sites were considered. It was found in each case that the sound level dba leq of the noise stimulus measured at the point ofassessment correlated well with the subjective preference scales, both externally and internally. However, there was no significant correlation of the internal preference scaleswith the external measured stimulus. This result was due tothe widely differing transmission characteristics of the building structure on the four sites measured, and suggests that the design of the structure is at least as important incontrolling the noise level inside the building as the external noise spectrum. A study was made of the correlation between the measured sound level results for four vehicles according to procedure 70/157/eec, which is currently used for legislative purposes, and the maximum level measured outside the building and the maximum level inside. It was found that the maximum level outside the building correlated well but the correlation with the measured indoor level was not significant. The conclusion from this work is that further reduction in the maximum noise levels permitted by existing procedures to national standards would, in general, lead to improvements in subjective assessment of the noise level outside urban buildings. Further improvement of the noise level inside buildings would be better achieved through controlling the noise transmission through the building facade, rather than devising an alternative, arbitrary test procedure using assumed building transmission characteristics. (TRRL)

Callow, GD Hedges, R
Motor Industry Research Association Monograph HS-032 888, 1980, 87p, Figs., Phots., 7 Ref.

Acknowledgment: TRRL (IRRD 254187)
Order From: Motor Industry Research Association, Watling Street, Nuneaton CV10 0TU, Warwickshire, England

341419

MOTORWAYS AND HEALTH-ACCIDENT CONTROL

The author evaluates the problems of accident prevention and in particular the human factor in assessing the fitness of drivers for motorway conditions. The action of driving requires a person to use all their senses to cope with constantly changing situations and conditions. To drive competently it is therefore contended that a person should be physically fit and adequately trained. A more demanding driving test is suggested before which a driver should have completed a definitive education and training program covering a specific number of hours. The complex nature of motorway accidents is discussed covering aspects of vehicle design improvements, safety belt effectiveness, and, the road environment. (TRRL)

O'Hanlon, RH (Staffordshire Police) *Royal Society of Health Journal* Vol. 100 No. 4, HS-032 881, Aug. 1980, pp 144-148, 1 Phot., 6 Ref.

Acknowledgment: TRRL (IRRD 254291)
Order From: Royal Society of Health, 13 Grosvenor Place, London SW1X 7EN, England

341628

MOTOR VEHICLE COST RESPONSIBILITY STUDY 1980

This study concerns the equitable assignment of highway costs among all classes of highway users. The report contains six chapters and four appendices. Chapter One presents "Oregon's Philosophy of Road User Charges" and discusses the philosophical principles, road user taxation characteristics, and current rates and fees. Chapter Two is on "The Need for a New Oregon Cost Responsibility Study". In this chapter, economic conditions and trends in Oregon are examined which underscore the timeliness of this 1980 study. Chapter Three discusses "The Oregon Cost Allocation Method" and the basic theory underlying the study. The cost vs expenditure allocation approach and other current issues are also discussed. Chapter Four, entitled "Cost Responsibility Methodology and Application", presents the methodology used in the study. It briefly discusses the steps and procedures used in the study. Chapter Five, entitled "Results and Implications", presents the cost responsibility results for three different budget levels. Comparisons are made with previous studies. The implications of the study results are discussed. Chapter Six, entitled "Recommended Tax Schedules and Subsidy Issues", presents the recommended tax schedules and discusses the subsidies inherent in the existing Oregon road user tax structure. The Major Findings and Recommendations for each budget level are presented. Appendix A discusses the history of Oregon road user taxation. Appendix B describes the administration of Oregon's third strucutre tax system. Appendix C gives a description of cost allocation methods presently in use. Appendix D gives the glossary of terms used in the study.

Oregon Department of Transportation Final Rpt. HS-033 227, March 1981, v.p., Figs, Tabs., Refs., Apps.

ORDER FROM: Oregon Department of Transportation, 140 Transportation Building, Salem, Oregon, 97310

345110

VISIBILITY IN CONSTRUCTION AND MAINTENANCE WORK ZONES

Several documents that will assist the engineer in planning and maintaining safe construction zone visibility are discussed and an attempt is made to relate positive experiences to the user. The resolution of construction zone problems may affect several administrative authorities, various modes of transport and several utility services. In order to maintain desired levels of service, it is important that uniform methods be available for guiding traffic through construction zones. Special attention should be devoted to the contributions of good visibility toward desired levels of service. Construction zone accident considerations are examined and a study by (ALTRANS) and studies in Illinois and Virginia are noted. The Federal Highway Administration's recommendations are also noted. Elements to be observed in achieving safe construction zones are listed. Construction work zones can be made safer through improvements in visibility conditions. Visibility improvements may be achieved through the construction of special warning devices such as signs, markings, delineation, barrier lighting, fixed overhead lighting, flood lighting, roadside sign lighting and signalization. Barriers may also be used. These methods could be combined with the following considerations: traffic flow, traffic volumes, pedestrian requirements, worker requirements, prevailing speeds, safe speeds and duration of construction.

Transportation Research Circular No. 232, HS-032 884, Oct. 1981, 6p, 1 Fig., 2 Tab., 34 Ref.

ORDER FROM: TRB Publications Off

345286

NHTSA'S FATAL ACCIDENT REPORTING SYSTEM

Accurate, reliable, and complete highway-traffic accident data are critical to well-planned and effective safety programs at the national, state, and community levels. Unfortunately, traffic safety program managers have been seriously handicapped by the lack of adequate data for planning and evaluation purposes. Complete data on all fatal traffic accidents, personal injury accidents, and property damage accidents would provide valuable information for safety program development. Current accident records systems, however, simply do not provide these complete data bases. This article describes the Fatal Accident Reporting System (FARS), administered by the National Highway Traffic Safety Administration (NHTSA). It is generally accepted as the most complete data base for fatal traffic accidents available today. The present file permits a variety of analyses not possible a few years ago. The Transportation Research Board considers this system a significant development in the national effort to improve the collection, analysis, and use of traffic accident data. (Editor)

Sebastian, AA Flemons, DM *Transportation Research News* No. 97, HS-032 797, 1981, pp 5-9, Figs., Tabs., Phots.

ORDER FROM: TRB Publications Off

345375

SAN ANTONIO MOTORIST INFORMATION AND DIVERSION SYSTEM

This report documents studies to evaluate the effectiveness of a low-cost motorist information diversion system (MIDS) in San Antonio, Texas. The system was implemented in 1977 as a demonstration program by the Texas State Department of Highways and Public Transportation, working in cooperation with the San Antonio Corridor Management Team. Its purpose was to alleviate congestion and reduce accidents on I-35 in San Antonio near the Central Business District. It included the following phases: 1. I-35 route change around the CBD, 2. use of a low-cost changeable message sign (CMS) system for freeway diversion, and 3. use of the CMS system for managing traffic during freeway maintenance. In addition to system effectiveness, the lessons learned from the demonstration program and recommendations for future urban MIDS systems are discussed. (FHWA)

Dudek, CL Stockton, WR Hatcher, DR

Texas Transportation Institute, Federal Highway Administration Final Rpt. FHWA-RD-81- 18, HS-032 783, Sept. 1981, 190p, 57 Fig., 25 Tab., 12 Ref., 11 App.

Contract DOT-FH-11-8505

ORDER FROM: NTIS

345815

MASKING OF BRAKE LIGHTS BY HIGH-INTENSITY REAR LIGHTS IN FOG

In fog the conspicuity of a vehicle may be increased by using high-intensity rear lights. However, these lights can be much brighter than the vehicle's brake lights and may mask them if they are installed too close to them. An experiment to investigate the effect of increasing the separation between these lights and the brake lights was conducted in artificial fog at TRRL. A rear light display of two brake lights and two high-intesity rear lights was situated in the peripheral visual field of the subject who had to react to the brake light onsets. At the same time subjects performed a second task, demanding similar concentration to driving, which also simulated a driver being distracted from looking straight ahead. Subjects reacted more quickly and missed fewer presentations as the separation between the brake lights and high-intensity rear lights was increased. The greatest improvement in performance occurred when the angular separation, between the lights as measured from the subjects viewpoint, was changed from zero (the lamps touching) to 5.7 minutes of arc with smaller further benefits occurring with angular increases up to 17 minutes of arc. It is suggested that a minimum separation between the different types of lamp of 100 mm would be the most suitable since this would meet the 5.7 minute of arc criterion during following at high speed in thin fog and would exceed this at the shorter viewing distances likely in thicker fogs. (Author/TRRL)

Helliar-Symons, RD Irving, A

Transport and Road Research Laboratory, (0305-1293) Monograph LR 998, HS-032 858, 1981, 14p, 4 Fig., 1 Tab., 2 Phot., 10 Ref.

ACKNOWLEDGMENT: TRRL (IRRD 258206)

ORDER FROM: TRRL

345894

BRAKING FORCE COEFFICIENTS OF WORN TYRES

The way in which car tyres become worn in practice are- evenly, with one shoulder wear, with double shoulder wear or with centre wear. Peak and locked wheel brake force coefficients have been measured for both new tyres and those worn in these various ways. The tests were done on two research track surfaces representing the extremes of rough and smooth surfaces likely to be found on roads. Speeds ranging from 30 km/h to 125 km/h were used. The motorway surface gave little difference for both locked or peak wheel conditions between the different tyres tested. On the brush concrete surface there was little difference between the most worn tyres irrespective of the type of wear. Full details are given in the report. (Author/TRRL)

Williams, AR Davies, VE (Dunlop Limited) Riley, BS Wilkins, HA

Transport and Road Research Laboratory, (0305-1315) Monograph SR

672, HS-033 000, 1981, 13p, 3 Fig., 2 Tab., 2 Phot., 4 Ref.
ACKNOWLEDGMENT: TRRL (IRRD 258218)
ORDER FROM: TRRL

345898
CAR OCCUPANT INJURY PATTERNS AND MECHANISMS
Over a two year period, in-depth crash-injury investigations were performed on a comprehensive sample of accidents involving nearly two and a half thousand car occupants. The study covered a fixed geographical area being based on the catchment area of one large accident hospital. Included in the study were all car occupants, including those escaping injury, who were involved in any accident where one or more casualties attended the hospital. The sample was, therefore, as closely representative of the whole accident injury situation as was possible. This report shows the relative frequencies of the different types of accident configuration and the associated risks of injury for the different seating positions and use or non-use of seat belts. The different patterns and mechanisms of injury are given for the basic impact types and because of the comprehensive nature of the sample it has been possible to put the severe but less frequent injuries into perspective with those more commonly occurring. For the more important causes of injury, in terms of clinical severity or frequency, distributions of injury severities are given along with details of the specific types of injury sustained. (Author/TRRL)

Hobbs, CA
Transport and Road Research Laboratory, (0305-1315) Monograph SR 648, HS-033 001, 1981, 15p, 1 Fig., 13 Tab., 7 Ref.

ACKNOWLEDGMENT: TRRL (IRRD 258426)
ORDER FROM: TRRL

346185
DRIVER UNDERSTANDING OF WORK ZONE FLAGGER SIGNALS AND SIGNALING DEVICES
The report documents the results of a human factors laboratory study conducted in Texas to evaluate driver understanding of 13 work zone flagger signals. A total of 123 motorists participated in the study, with 23 to 73 motorists viewing each signal. The signals evaluated included: (1) seven standard signals recommended in the 1980 Texas Manual on Uniform Traffic Control Devices (MUTCD), (2) two signals recommended in the 1973 Texas MUTCD but not included in the 1980 Texas MUTCD, (3) two signals recommended for use by police, and (4) two non-standard signals which combined standard signals from the 1980 Texas MUTCD. A STOP-SLOW sign paddle, red flag, and/or hand motions were used to perform the various signals.

Richards, SH Huddleston Bowman, JD
Texas Transportation Institute, Federal Highway Administration, Texas State Department of Highways & Public Transp Res Rpt. TTI-2-18-78-228-3, HS-033 214, Jan. 1981, 39p
Sponsored in part by Texas State Dept. of Highways and Public Transportation, Austin. Transportation Planning Div.

ACKNOWLEDGMENT: NTIS
ORDER FROM: NTIS PB82-119256

346840
HIGHWAY ACCIDENT REPORT: CONTINENTAL TRAILWAYS, INC., SCHEDULED INTERCITY BUS/MULTIPLE-VEHICLE COLLISION AND FIRE, INTERSTATE ROUTE 95 NEAR BELTSVILLE, MARYLAND, APRIL 20, 1981
About 5:55 p.m. on April 20, 1981, a scheduled intercity bus with 34 passengers onboard was southbound on Interstate Route 95 (I-95) en route to Washington, DC via Silver Spring, Maryland. As the bus approached the Interstate Route 495 (Capital Beltway) interchange, the traffic ahead in the right lane slowed and came to a stop. The bus failed to stop, crashed into the rear of the automobile ahead of it, and precipitated a four-car, front-to-rear-end collision. Two of the automobiles burst into flames which quickly spread to and engulfed the bus after it had been evacuated. Three occupants of the automobile struck by the bus were killed. The drivers of the other three automobiles, the busdriver, and the 34 bus passengers received minor injuries. The National Transportation Safety Board determines that the probable cause of this accident was the failure of the busdriver to maintain a safe stopping distance between the bus and the automobile ahead as traffic ahead slowed and came to a stop during the peak traffic period.

National Transportation Safety Board NTSB-HAR-81-5, Sept. 1981, 27p

ACKNOWLEDGMENT: NTIS
ORDER FROM: NTIS PB82-117524

347116
ESTIMATES OF DIRECT COSTS TO THE STATE RESULTING FROM TRAFFIC ACCIDENTS
The project provided quantitative estimates of traffic accident related direct expenditures from state tax revenues as a result of traffic accidents. This report serves three purposes. The first is to detail the methodology and the sources of data. The second is to present estimates of the costs. The third is to show how the cost estimates can be used to estimate the likely benefits of countermeasures related to highway safety. The estimated annual direct cost to the state has been computed to be 21.5 million dollars, with 13.9 million associated primarily with injuries, 2.7 million with property damage, and 4.9 million associated with both injuries and property damage.

Andary, JJ Flora, JD Huelke, DF O'Day, J
Michigan University, Ann Arbor Final Rpt. UM-HSRI-81-40, Aug. 1981, 100p

ACKNOWLEDGMENT: NTIS
ORDER FROM: NTIS PB82-120882

347138
SPECIAL STUDY--FATALITIES AND INJURIES ASSOCIATED WITH RIDING IN CARGO AREAS OF PICKUP TRUCKS
An average of 242 persons were killed each year from 1975 through 1979 in accidents while riding in the cargo areas of pickup trucks, according to data from the National Highway Traffic Safety Administration's (NHTSA) Fatal Accident Reporting System (FARS). In 1979, the Safety Board investigated an accident involving a compact pickup truck in which the driver and three persons were riding in the cab and eight persons were in the open-cargo area of the truck. The driver failed to negotiate a curve and the truck ran off the road and overturned. Seven persons in the cargo area were killed. As a result of its investigation of this accident, the Safety Board recommended that the National Committee on Uniform Traffic Laws and Ordinances (NCUTLO) establish model guidelines for prohibiting passengers from riding in open cargo areas of most vehicles. The NCUTLO had considered model guidelines on a broader scale in 1975, but because of several complications, the proposal was rejected. This study was made to demonstrate further the need for model guidelines prohibiting passengers from riding in the cargo area of a vehicle, and to make available information about the dangers to passengers riding in the open cargo area of a vehicle.

National Transportation Safety Board NTSB-HSS-81-2, Sept. 1981, 21p

ACKNOWLEDGMENT: NTIS
ORDER FROM: NTIS PB82-115593

347695
HAZARDOUS MATERIALS MANAGEMENT SYSTEM. A GUIDE FOR LOCAL EMERGENCY MANAGERS
An increase in the manufacture, storage, and transportation of hazardous materials is occurring across the nation. Local jurisdictions have realized that they have the responsibility to assure a reasonable level of safety to their community members and visitors alike. Such a responsibility can be met by developing methods of preventing hazardous materials incidents, enforcing laws related to transporting and storing hazardous materials, initiating an appropriate first response, and activating available resources of government agencies and commercial organizations that deal with containment and clean up. This manual has been written to help in the development of a total Hazardous Materials Management System. The manual describes one approach but allows for variations as may be appropriate for the specific jurisdiction. (Author)

Lee, MT Roe, PG
Multnomah County Office of Emergency Management Final Rpt. MCOEM-0779, July 1981, 137p
Contract DCPA01-79-C-0323

ACKNOWLEDGMENT: NTIS
ORDER FROM: NTIS AD-A104437/9

347818

HAZARDOUS MATERIAL TRANSPORTATION RISKS IN THE PUGET SOUND REGION

In order to contribute to workable hazardous materials accident prevention and response systems, public safety risks of transporting hazardous materials in the Central Puget Sound Region of Washington State are determined. Risk spectrums are obtained which express the magnitude and frequency of all possible losses due to releases of five classes of hazardous materials representing 74 percent of the 1.9 million tons moved in the region by truck and rail in 1979. Five commodities representative of these classes are selected and discussed: liquid petroleum gas, chlorine, methanol, anti-knock compound, and sodium hydroxide. Release sequences are identified, using a fault tree approach for specific transportation equipment, and are evaluated for each commodity and transportation mode to predict probabilities of releases given a transportation accident. Environmental factors considered include accident rates, weather conditions, and population along each major transportation route. Truck and rail contributions to risk are found to be nearly equal, with liquefied petroleum gas dominating truck risk, and chlorine dominating rail risk.

Andrews, WB Rhoads, RE Franklin, AL Cole, WM Rau, RG
Battelle Memorial Institute/Pacific Northwest Labs, Transportation Systems Center Final Rpt. DOT-TSC-RSPA-81-11, Sept. 1981, 118p
Contract DTRS-57-80-C-00170

Acknowledgment: NTIS
Order From: NTIS PB82-138850

347822

OPERATIONAL AND SAFETY EFFECTS OF DRIVING ON PAVED SHOULDERS IN TEXAS

Paved shoulders in Texas are used by many drivers for making a large variety of traffic maneuvers and for satisfying numerous driving task demands. Unfortunately, there is little information as to the types and frequencies of this usage and the impacts and conditions under which they occur. This report documents research that was directed at providing answers to these questions. A combination questionnaire and personal interview technique was used to gain additional insight into this issue. The study also investigated driver preferences for and experiences with shoulder usage. Accident historics were determined for three different types of rural Texas highways-two-lane without paved shoulder roadways, two-lane with paved shoulder roadways and undivided four-lane without paved shoulder roadways. Data were collected on 21,000 vehicles at 18 different sites. Recommendations for more efficiently utilizing and controlling paved shoulder usage are presented.

Fambro, DB Turner, DS Rogness, RO
Texas Transportation Institute, Federal Highway Administration, Texas State Department of Highways & Public Transp Final Rpt. TTI-2-18-79-265-2F, FHWA-TX-81/31-265-2F, Jan. 1981, 218p
Sponsored in part by Texas State Dept. of Highways and Public Transportation, Austin. Transportation Planning Div.

Acknowledgment: NTIS
Order From: NTIS PB82-142308

347826

THE LEGIBILITY OF HIGHWAY GUIDE SIGNS WITH SPECIAL REFERENCE TO CARDINAL DIRECTION INDICATIONS

The report is concerned with the legibility of the message elements displayed on the highway guide signs. The work was carried out on a vision testing alley, using scaled down replicas of highway signs. Cardinal Direction indications (North, South, East, West) demonstrated satisfactory legibility. The findings indicate that route numbers had poorest legibility of the eight types of information displayed on the guide signs tested. They were seen at 10 percent shorter distance than place names.

Gordon, DA
Federal Highway Administration Final Rpt. FHWA-RD-80-170, HS-032 772, June 1981, 36p, 4 Fig., 9 Tab., 5 Ref., 3 App.

Acknowledgment: NTIS
Order From: NTIS PB82-143868

347917

EVALUATION OF STATE MOTORCYCLE HELMET LAWS USING THE NATIONAL ELECTRONIC INJURY SURVEILLANCE SYSTEM

This report analyzes motorcyclist injury data collected by the National Electronic Injury Surveillance System (NEISS) from October 1978 through December 1980. Head area injury rates were compared for NEISS-reporting States with and without a mandatory helmet use law. The States without a helmet law had significantly greater head area injury rates than the States with a helmet law. In addition, the serious injury rate for the head and neck were significantly lower in the States having a helmet law as compared with the States not having a helmet law. It was concluded that State motorcycle helmet law's are effective in decreasing all motorcyclist head area injury rates as well as lowering most head area serious injury rates.

Berkowitz, A
National Highway Traffic Safety Administration, (NTS-41) Final Rpt. HS-806 062, Oct. 1981, 12p, 6 Tab.

Acknowledgment: NTIS
Order From: NTIS PB82-157140

348114

PROCEEDINGS OF THE VITH INTERNATIONAL IRCOBI CONFERENCE ON THE BIOMECHANICS OF IMPACTS, SALON DE PROVENCE, 8,9,10 SEPTEMBER 1981

The VIth International IRCOBI Conference on the biomechanics of impacts was divided into a session on minor injuries and long term consequences, a session on two-wheelers and a session on experimental studies. (TRRL)

IRCOBI Monograph HS-033 156, Sept. 1981, 362p, Figs., Tabs., Phots., Refs.

Acknowledgment: TRRL (IRRD 258650), Institute for Road Safety Research
Order From: IRCOBI Secretariat, 109 Avenue Salvador Allende, Bron 69500, France

348376

TRAFFIC ACCIDENT COSTS BORNE BY THE STATE OF MICHIGAN

An HSRI research study was conducted to estimate the various direct costs borne by the State of Michigan as a result of traffic accidents. Such figures are useful for assessing the benefits of proposed highway safety countermeasures. Total direct costs to the state were estimated to be $21.5 million annually. Of ten cost components, the four largest are $8.9 million in state Medicaid payments to hospitals, $3.6 million in litigation and judgments, $3.1 million in aid to dependent children of accident victims, and $2.7 million in unreimbursed costs of repairing roadway damage caused by traffic accidents. (Author)

Flora, JD *HSRI Research Review* Vol. 12 No. 3, HS-032 842, Nov. 1981, 8p, 2 Tab., Refs.

Order From: Highway Safety Research Institute, Huron Parkway and Baxter Road, Ann Arbor, Michigan, 48109

348578

HUMAN FACTORS AND DRIVING PERFORMANCE

The relative importance of a variety of human factor variables to driving performance was investigated using a representative sample of 60 drivers. Factors considered included: visual and perceptual abilities, risk taking, reaction time measures, biographical, attitudinal and personality variables and physiological measures of stress. Driving performance was assessed by obtaining accident and exposure histories for the previous 3 years and also by considering the number of driving errors committed on a test drive. In the analysis special attention was given to identifying any age differences revealed by the results that might help to explain why accident rates vary with age. Results indicated that the variable measuring risk taking was most highly correlated with driving performance. The driver's attitude to safety and measures of visual and perceptual abilities, such as acuity, risk assessment and hazard perception--measured both on the road and in a simulator--were also relatively important. Additional variables that were significantly correlated with driving performance included: age, socio-economic group number, annual kilometres driven, additional driver training, one's personality factor and a physiological measure of stress. Several of the variables showed significant age effects. The findings are discussed and their importance to road safety is considered. (Author/TRRL)

Quimby, AR Watts, GR
Transport and Road Research Laboratory, (0305-1293) Monograph LR 1004, HS-033 102, 1981, 36p, 10 Fig., 8 Tab., 48 Ref.

ACKNOWLEDGMENT: TRRL (IRRD 258438)
ORDER FROM: TRRL

348580
WAYS AND MEANS FOR IMPROVING DRIVER ROUTE GUIDANCE

This report considers a wide range of possible methods for improving the route guidance information available to drivers, and for saving up to 600M per year of national resource costs which are effectively wasted by drivers who fail to select optimum routes for unfamiliar journeys. The methods considered include improvements to maps and roadsigns, both of which could prove highly cost effective although they would leave some 80 per cent of the wastage unrecovered. A substantial proportion of this remaining wastage might be avoided with a viewdata route planning and guidance scheme which could be achieved at relatively low cost to public funds, or with automatic systems. Of a range of automatic electronic guidance systems considered the most cost effective solution would be provided by a system which used buried loops to provide a two-way communication link between a roadside and a vehicle unit. Such a scheme would necessarily involve a considerable investment from public funds, but would offer the greatest potential for further development and, in particular, could provide the basis of a comprehensive traffic control tool. (Author/TRRL)

Jeffery, DJ
Transport and Road Research Laboratory, (0305-1293) Monograph LR 1016, HS-033 109, 1981, 21p, 1 Fig., 1 Tab., 18 Ref.

ACKNOWLEDGMENT: TRRL (IRRD 258441)
ORDER FROM: TRRL

348583
A MANUAL TO DETERMINE BENEFITS OF SEPARATING PEDESTRIANS AND VEHICLE

A comprehensive method for evaluating the social, environmental and economic benefits of proposals for facilities separating pedestrians and vehicles was developed and demonstrated in an earlier NCHRP Project (20-10). This report gives the results of Project 20-10(2) which extends the usefulness of the method by simplifying it and preparing audiovisual materials to supplement the technical user guide. This study which developed techniques for quantifying all direct and indirect benefits, grouped the benefits in three categories: transportation, safety/environmental health, and residential/business. Within each category are groups such as pedestrians, motor vehicles, and other community transportation, and "variables" which are the major focus of benefit measurements. The feasibility of applying the evaluation method for use in pedestrian traffic warrants was evaluated. Three different presentations of the method have been prepared and tested: a technical user guide, a videotape, and a slide show.

Roddin, MF (SRI International) *NCHRP Report* No. 240, HS-032 998, Nov. 1981, 56p, Figs., Tabs., 26 Ref., 3 App.

ORDER FROM: TRB Publications Off

348653
THE APPLICATION OF TRAFFIC SIMULATION MODELS

This publication presents an overall summary, the resource papers and workshop summaries of a conference on traffic simulation models. The conference had two objectives: to inform the user community about what models are available and what is planned for their future development; and to obtain feedback from users on their experiences in the application of simulation models and the needs that become apparent with experience. Four papers were presented on existing models for traffic simulation analysis. Three papers reported user experience with the most widely used traffic network simulation model--NETSIM. Two papers examined current and future developments. The workshop sessions covered the application of simulation by models by different user groups, and technical issues in simulation modeling and application. Papers presented at the workshops and papers presented for the proceedings are also included.

Transportation Research Board Special Report No. 194, HS-033 008, 1981, 114p, Figs., Tabs., Refs.

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348914
AGE, DRIVING EXPERIENCE, AND ENGINE CAPACITY AND THEIR EFFECTS ON MOTORCYCLE ACCIDENTS

This paper considers the effect of age, length of time a motorcycle licence has been held and engine capacity on an exposure-adjusted accident rate. It was found that the engine capacity of the motorcycle has no significant effect on the motorcycle accident rate but that the age and driving experience of riders do have a statistically significant effect on the accident rate. It is concluded that further legislation on engine capacity restrictions is not warranted by this study's findings but that restrictions on low experience and age groups in the form of an "apprenticeship" involving restrictions as to hours in which motorcycles may be used may well produce a reduction in the accident rate. (Author)

Hull, M *Traffic Research Circular* No. 17, HS-033 132, Oct. 1981, 17p, Figs., Tabs., Apps.

ORDER FROM: Ministry of Transport, New Zealand, Private Bag, Traffic Research Section, Wellington, New Zealand

348932
OBSERVATIONS OF SOME RAC/ACU MOTORCYCLE TRAINING SCHEMES

Observations were carrried out at 42 motorcycle training centres run by the Royal Automobile Club and the Auto Cycle Union (RAC/ACU centres) during 1979. Trained observers visited each centre three times to see how the theoretical and practical instruction was carried out. The results show that there are a number of ways of approaching the problems of motorcycle training, for different centres have developed methods of organization and training. The survey highlighted some of these differences and also indicated some general weaknesses which were found at a number of centres. A problem at many centres was seen to be the lack of adequate record keeping and the consequent timewasting for trainees which could occur. On the other hand, at most centres there was a good instructor/pupil ratio. (Author/TRRL)

Wells, P
Transport and Road Research Laboratory, (0305-1315) Monograph SR 694, HS-033 107, 1981, 17p, 22 Tab., 3 Ref.

ACKNOWLEDGMENT: TRRL (IRRD 259019)
ORDER FROM: TRRL

348939
THE EFFECT OF MOTORWAY SIGNALS ON TRAFFIC BEHAVIOUR

In January 1978 the installation of ten sets of vehicle speed measuring and recording equipment was completed on a 19 kilometre section of the north-bound carriageway of the M1 between junctions 10 and 13 in Bedfordshire. Vehicle speeds were recorded 400 metres past standard post mounted matrix signals to measure the effectiveness of the signals. During the period January 1978 to November 1979 there were 421 occasions when matrix signals were set for 120 minutes or more. Accident, visibility and roadworks were the most common reasons for signal settings. In total 1576 signals were set during this period with an advisory 50 mile/h speed limit being most frequently displayed. For short vehicles an advisory speed restriction of 50 mile/h set for accidents or other incidents slowed vehicles by about 6 km/h (4 mile/h). For a 50 mile/h restriction set for poor visibility the reductions were about 8 km/h(5 mile/h). Similar reductions were measured on weekdays and weekends. Speed restrictions of 60 mile/h had less effect on speed while larger reductions were measured for 40 mile/h, 30 mile/h and restrictions showing lane closures. Long vehicles slowed by about half the reductions measured for the faster travelling short vehicles. (Author/TRRL)

Lines, CJ
Transport and Road Research Laboratory, (0305-1315) Monograph SR 707, HS-033 105, 1981, 20p, 3 Fig., 7 Tab., 1 Phot., 7 Ref.

ACKNOWLEDGMENT: TRRL (IRRD 259042)
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348941
THE USE OF VIDEO-TAPE RECORDINGS OF CHILDREN'S ROAD BEHAVIOUR

An invesigation was made of the use of video-recording as part of a broad-front approach to road-safety teaching in Wolverhampton's primary schools. This use of a concealed video camera to record children's road behaviour for immediate replay to the children in school was subsequently developed and evaluated under controlled conditions in nine schools. The results fail to confirm the effectiveness of the use of video in road-safety education when used in isolation, but suggest a prima facie case for its continued use as part of a wider road-safety scheme. (Author/TRRL)

Cyster, R (National Foundation For Educational Research)
Transport and Road Research Laboratory, (0305-1315) Monograph SR 684, HS-033 108, 1981, 25p, 4 Tab.

ACKNOWLEDGMENT: TRRL (IRRD 259045)
ORDER FROM: TRRL

348957

APPLICATION OF LOW-COST ROAD ACCIDENT COUNTERMEASURES ACCORDING TO AN AREA-WIDE STRATEGY

The project described used a 2.8 km section of the a345 all purpose arterial road running radially from the edge of swindon central area to the urban boundary to show how road safety and traffic efficiency could be improved using the strategy. Previous statistics showed that the majority of accidents on the route were associated with a right-turn manoeuvre at one of the many intersections on the road. The effectiveness of a package of safety measures introduced along the study route was monitored in parallel with control sections of similar routes and possible alternative routes. Although the control procedure failed because of fundamental differences in the chosen routes and the study route, there was a genuine 10 per cent reduction in accidents along the study route associated with a reduction in delays to other traffic caused by vehicles waiting to turn right. Travel time, fuel consumption and intersection capacity have also improved. There appeared to be no adverse effect on the accessibility to residential premises lying behind the study route. It was estimated that the first-year rate of return of the cost was about 55 per cent. (TRRL)

Dalby, E (Transport and Road Research Laboratory) Ward, H (University College, London) *Traffic Engineering and Control* Vol. 22 No. 11, HS-032 787, Nov. 1981, pp 567-575, 4 Fig., 4 Tab., 7 Ref.

ACKNOWLEDGMENT: TRRL (IRRD 258890)
ORDER FROM: Printerhall Limited, 29 Newman Street, London, England

349031

TRANSIENT RESPONSE TEST PROCEDURES FOR MEASURING VEHICLE DIRECTIONAL CONTROL

A comparative study of four different test procedures for quantifying the transient lateral response of automobiles is presented in this paper. Both full-scale testing and analysis have been used in this study. The random steering technique appears to offer several advantages over other procedures in terms of space-requirement and the amount of transient dynamics information generated, whereas the step-steering procedure is more suited to the measurement of steady-state behaviour of the automobile.(a) (TRRL)

Verma, MK (General Motors Research Laboratories) *Vehicle System Dynamics* Vol. 10 No. 6, HS-032 788, Nov. 1981, pp 333-356, 20 Fig., 10 Ref.

ACKNOWLEDGMENT: TRRL (IRRD 258943)
ORDER FROM: Swets en Zeitlinger BV, Heereweg 347B, 2161 CA Lisse, Netherlands

349081

GRADUATED SYSTEM OF FEES FOR AUTOMOBILE REGISTRATION IN VIRGINIA

A system of graduated registration fees based on the classification of the automobile stock into subcategories by weight is examined for Virginia. The feasibility of such a fee system and other alternatives for classification of the automobile fleet are explored. An econometric forecasting model based on a series of multiple-regression equations is then developed to model the weight classification scheme and to determine the potential impacts of such a system of registration fees on the transportation revenues of the Virginia Division of Motor Vehicles. Registration revenues are expected to decline under any tax scheme. However, a weight-based system of graduated fees that favors smaller automobiles will precipitate the decline. Under the moderate-inflation scenario, the loss may amount to well over $6.5 million/year by 1985. Future fuel and automobile prices will merely dictate the speed and the degree of loss in revenues. (Author)

Hobeika, AG Tran, TK Gordon, F (Virginia Polytechnic Institute & State University) *Transportation Research Record* No. 826, HS-033 054, 1981, pp 12-18, 6 Tab., 9 Ref.

This paper appeared in TRB Record 826, Transportation Programming, User Benefit Analysis and Vehicle Licensing.

ORDER FROM: TRB Publications Off

349138

VEHICLE AND DRIVER EFFECTS ON JUNCTION GAP ACCEPTANCE

Observations of driver's gap acceptance were made at four non-urban t junctions in Surrey and Sussex. The movements studied, using a video technique and a microprocessor, were a left turn merging with the traffic in the major road, and a right turn crossing the major road to a minor road. Empirical relationships between gap acceptance and the time taken to complete a turn are derived for cars. Turning goods vehicles as a class show significantly longer median accepted gaps than turning cars. Differences between the median accepted gap for different classes of vehicle are explained largely by the manoeuvre time that each class requires. The effect of passengers was studied, but no consistent effects were apparent. Women drivers were found to have longer median accepted gaps than men in all cases. Car drivers who accept short gaps complete their manoeuvres more quickly than those accepting longer gaps. The gap acceptance response appears to be directly related to the acceleration capabilities of vehicles. A conflict simulation model was used to assess the accident risks. This showed that drivers with short manoeuvre times appeared to be involved in more and more severe model conflicts than those with long manoeuvre times. (TRRL)

Wennell, J (Royal Holloway College) Cooper, DF (Southampton University, England) *Traffic Engineering and Control* Vol. 22 No. 12, HS-032 837, Dec. 1981, pp 628-632, 3 Fig., 10 Tab., 25 Ref.

ACKNOWLEDGMENT: TRRL (IRRD 259330)
ORDER FROM: Printerhall Limited, 29 Newman Street, London, England

349256

THE PEDESTRIAN IN THE TRANSPORTATION SYSTEM: PROPOSED TRAFFIC SAFETY LEGISLATION

The purposes of this project were to review and evaluate Virginia's traffic laws related to pedestrians, compare provisions of the Code of Virginia with those of the statutes of other states and the Uniform Vehicle Code, and, if appropriate, propose amendments, additions, or deletions to the Code of Virginia which would enhance safe walking in the Commonwealth. The study was carried out with the advice assistance of an advisory panel composed of representatives of federal, state, and local governmental agencies, various organizations concerned with the promotion of safe walking as recreation or mobility, the National Committee on Uniform Traffic Laws and Ordinances, and the Tidewater Automobile Association of Virginia. Several general problem areas, in both the context of fatalities and injuries and the Code itself, were identified. The research revealed that there are more injuries to pedestrians in urban areas but more fatalities in rural areas, and that most of those killed and injured are over the age of 15. In addition, it was found that the three most dangerous situations for the pedestrian are crossing at locations other than an intersection, crossing at nonsignalized intersections, and walking in the roadway in the direction of traffic. Also, while crashes involving pedestrians with visual handicaps do not constitute a large percentage of the total, they do warrant special attention. Finally, provisions of the state code are not sufficiently protective of the pedestrian's rights nor definitive of the pedestrian's duties to provide for a safe walking environment. A number of suggestions for revisions to the Code are made to clarify the actions required of pedestrians and motorists at intersections, and pedestrians walking along the highway, crossing roadways at points other than intersections, working in the roadway or upon the highway, playing in the roadway, and responding to emergency, bridge, or railroad signals. (Author)

Stoke, CB Williams, CL
Virginia Highway & Transportation Research Council VHTRC 82-R27, HS-032 883, Nov. 1981, 21p, 6 Tab.

ORDER FROM: Virginia Highway & Transportation Research Council, P.O. Box 3817, University Station, Charlottesville, Virginia, 22903

349257

ASSESSING THE SAFETY EFFECTS OF FEDERAL MOTOR VEHICLE SAFETY STANDARD 121

In late 1981 the National Highway Traffic Safety Administration accepted the final technical report of an HSRI study it had been sponsoring for six years, since October, 1975. The purpose of the study was to assess the safety effects of FMVSS 121. Standard 121, put into effect in January, 1975, included a provision that new airbraked trucks sold after that date be capable of braking to a controlled stop from 60 mph in a distance of no more than 245 feet. The rationale was that trucks capable of braking that rapidly would be involved in fewer traffic accidents. The HSRI study examined that question by collecting and analyzing data concerning accident involvements of trucks built before and after Standard 121 vehicles in use during calendar years 1976-1978 had a rate of accident involvement significantly lower or higher than that of comparable pre-121 vehicles. The study conclusions are those of the author and not necessarily those of the NHTSA. (Author)

Campbell, KL Haney, J *HSRI Research Review* Vol. 12 No. 4, HS-032 951, Jan. 1982, 8p, 1 Fig., 6 Tab.

ORDER FROM: Highway Safety Research Institute, Huron Parkway and Baxter Road, Ann Arbor, Michigan, 48109

349259

DWI-DRIVING WHILE INTOXICATED

The Governor's Alcohol and Highway Safety Task Force sets one clear goal: to reduce dramatically the incidence and tragic consequences of drunk driving in New York State. To achieve this goal, the Task Force recommends a comprehensive systems approach that will raise perception of risk through public education and increased detection and apprehension; cause swift removal of the license and certain application of substantial penalties; and, provide access to appropriate rehabilitation services. Operating within this framework, the Task Force's comprehensive program will: change from a one-track criminal proceedings system to a two track-administrative and criminal; reduce license action from six months to one week; enact legislation requiring that a driver who is alleged to be operating a motor vehicle with a blood alcohol cocentration (BAC) of .10 or above would have five days within which to request an administrative hearing concerning whether he had such a blood alcohol concentration; provide for a mandatory 90-day license suspension upon either the waiver of the hearing or a finding that the driver operated a motor vehicle with a blood alcohol concentration of .10 or above; impose mandatory fines as a result of court action; mandate seven days in jail for driving while license is revoked/suspended for an alcohol offense; develop a statewide interdepartmental police DWI enforcement campaign; organize enforcement campaigns including systematic traffic check points and consistent, coordinated public information programs to raise the public perception of the risk of apprehension; expand the grounds for requesting that a driver be asked to submit to an alcohol impairment screenig test; eliminate fingerprinting requirement (local option) to put more police on patrol; mandate occupant restraint usage-all occupants of a motor vehicle be required to use seat belts to reduce crash fatalities and injuries; coordinate all alcohol and highway safety public information and education activities; encourage community level responsibility; ensure appropriate education programs for convicted drinking drivers; demonstrate new screening models to improve referral of problem drinkers to appropriate rehabilitation programs; support changes in improved design of vehicles and roadways; include research and evaluation function in all activities;and encourage all alcohol and highway safety programs be user-funded. (Authro)

Foschio, LG, Commissioner, Department of Motor Vehicles (New York State Department of Motor Vehicles) Blume, SB, Director, Division of Alcoholism and Alcohol Abuse
Governor's Alcohol Highway Safety Task Force HS-032 945, No Date, 27p, Figs., Tabs., Phots., Refs.
Grant AL 80-015(002)

ORDER FROM: Governor's Alcohol Highway Safety Task Force, Empire State Plaza, Swan Street Building, Albany, New York, 12228

349261

FACTORS ASSOCIATED WITH FATAL ACCIDENT INVOLVEMENT AMONG CALIFORNIA DRIVERS

The primary objectives of this study were to examine characteristics of drivers involved in fatal accidents and to determine if those drivers could be distinguished from California's general driving population on the basis of prior driving record. A sample of drivers involved in 1970-71 fatal accidents was analyzed and compared to a sample of drivers from the general driving population during the same time period. The accident group analyses indicated moderate ability to identify fatal accident types that could be differentiated on the basis of the driver's prior characteristics. Specifically, drivers who had been drinking prior to the accident, who were considered "at fault" for the accident, or whose accident occurred at night were found to have worse prior driving records than other fatal accident-involved drivers. The results also indicated that, as a whole, drivers involved in fatal accidents evidenced worse violation and/or accident records, as well as different demographic and license characteristics than drivers in the general population. However, the classification functions derived to predict fatal accidents did not differ greatly from regression equations that have been constructed to predict total accidents. It was therefore concluded that prediction systems keyed to total accidents will, to a large extent, also identify high risk fatal accident drivers. (Author)

Garretson, M Peck, RC
California State Department of Motor Vehicles CAL-DMV-RSS-81-79, HS-033 072, Dec. 1981, 49p, Tab., Refs., Apps.

ORDER FROM: California State Department of Motor Vehicles, P.O. Box 11828, 2415 1st Avenue, Sacramento, California, 95813

349535

DRIVER KNOWLEDGE OF ROAD SAFETY FACTORS IN THREE DEVELOPING COUNTIRES

In order to gain an understanding of drivers's knowledge of road safety matters in developing countries, drivers in Jamaica, Pakistan and Thailand were asked questions about traffic rules and recommended driving procedures. Only with a few topics was a widespread lack of knowledge evident in each country. In all three countries most of the drivers considerably underestimated their vehicle stopping distances. In Jamaica and Paksitan many drivers did not know the give-way rules at roundabouts, correct observation procedures at junctions and the meaning of flashing headlights. In addition, several drivers in Pakistan gave wrong answers to questions on traffic lights, give-way signs and stop signs. Most drivers in this study gave correct answers to the pedestrian crossing questions, yet, in an earlier study, the majority of the large number of drivers observed failed to give way for pedestrians on uncontrolled crossings. It is likely that they did so knowing that they should have stopped. It is recommended that further research be carried out so that appropriate remedial measures can be selected to improve road user behaviour in developing countries. (Author/TRRL)

Sayer, IA Downing, A
Transport and Road Research Laboratory, (0305-1315) Monograph NSR 713, HS-033 104, 1981, 15p, 12 Tab., 6 Ref.

ACKNOWLEDGMENT: TRRL (IRRD 259396)
ORDER FROM: TRRL

349540

THE EFFECT OF VEHICLE TILT ON MEASURED WHEEL LOADS

Up-to-date information on axle-loads is required for pavement design and overlay design purposes. In developing countries this information will often be obtained from axle-load surveys in which portable wheel weighers are used to weigh wheel loads at the roadside of a sample of vehicles in the traffic stream. The effects on measured wheel loads of tilting vehicles or raising individual wheels and axles are described. Large errors in estimating axle loads from individual wheel loads may occur if one wheel of an axle is raised relative to the other wheels of a vehicle. It is recommended that when undertaking axle-load surveys of this kind the wheel-weighing platform should be set in a pit so that all wheels of vehicles being weighed are in the same plane, which preferably should be horizontal. (Author/TRRL)

Potocki, FP
Transport and Road Research Laboratory, (0305-1315) Monograph NSR 708, HS-033 106, 1981, 9p, 1 Fig., 3 Tab., 4 Phot., 3 Ref.

ACKNOWLEDGMENT: TRRL (IRRD 259409)
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349811

CRASH TESTING OF A PORTABLE ENERGY-ABSORBING SYSTEM FOR HIGHWAY SERVICE VEHICLES

This paper is concerned with the testing of a new portable energy-absorbing system to be attached to the rear of a highway service vehicle. The research objective was to design a system to provide protection for both the motoring public and the service personnel engaged in maintenance operations on our highways. Its implementation during highway line-striping operations, which are conducted on almost a daily basis, would be of particular value. The energy-absorbing components of the system are four steel pipes connected in a series and cantilevered from the rear of the service vehicle.

Full-scale crash tests were conducted to evaluate the performance of the system with respect to (a) structural adequacy, (b) impact severity, and (c) vehicle trajectory. The results of this testing program demonstrate that this energy-absorbing system provides protection during a collision for both the errant motorist and the state personnel working in the service vehicle. The unit is relatively light, inexpensive to construct and repair, and is compactly designed for use on curved and hilly roads. (Author)

Carney, JF, III (Auburn University) *Transportation Research Record* No. 833, 1981, pp 32-37, 6 Fig., 14 Ref.

This paper appeared in Transportation Research Record No. 833, Work Zone Safety, Maintenance Management and Equipment, and Transportation of Hazardous Materials.

Order From: TRB Publications Off

349930

SHALLOW SNOW MODEL FOR PREDICTING VEHICLE PERFORMANCE

A historical review of research is presented to establish the state-of-the-art for analyzing the behavior of vehicles in shallow snow. From this review, the most comprehensive and promising model is put together to establish a first-cut performance prediction model for vehicles operating in shallow snow, slush, ice and thawing soils. (Author)

Harrison, WL
Cold Regions Research and Engineering Laboratory, Directory of Military Programs CRREL 81-20, HS-033 210, Oct. 1981. 25p, Figs., Tabs., Refs., Apps.

Order From: NTIS AD-A108343

349949

MODEL SYSTEM FOR EVALUATING SAFETY PROJECTS USING STATE RECORD SYSTEMS

This study found that national recordkeeping systems do not permit evaluations of countermeaure effectiveness because they are accident oriented rather than site oriented. On the other hand, State recordkeeping systems can provide the data to perform such evaluations. State systems can also provide the means for storing and maintaining the safety project evaluations performed by traffic engineers. The study presents a model system to do the following: 1. Store and maintain safety project evaluations. 2. Match hazardous sites with similar sites where a safety project has been implemented and evaluated. 3. Perform, on request, computer based evaluations of safety projects using existing recordkeeping systems data. (FHWA)

Conley, CG Abbott, FP Brinkman, CP Tom, J
Verve Research Corporation, Federal Highway Administration, (VS-67) Final Rpt. FHWA-RD-81-186, Jan. 1982, 68p
Contract DOT-FH-11-9484

Order From: NTIS PB82-202516

349952

EVALUATION OF DESIGN AND CONTROL ALTERNATIVES TO IMPROVE SAFETY OF INTERSECTIONS OF MULTI-LANE HIGHWAYS WITH OTHER HIGHWAYS

The important results of earlier phases of this research-1) correlation of accident rates and selected roadway design and traffic engineering factors; 2) utilization of a team apprach to field evaluation of accident types, causal factors and countermeasures at high accident sites and 3) the use of a simulation program to analyze possible countermeasures for high accident locations-- are summarized in this report. I addition 18 high accident intersections in Indiana selected by the Indiana State Highway Commission are individually analyzed using the results of the earlier phases of this Study, and recommended countermeasures for reduction of the accidents at these sites are presented. (FHWA)

Michael, HL Sinha, KC Fletcher, JA
Purdue University/Indiana State Highway Comm JHRP, Indiana State Highway Commission, Federal Highway Administration, (JHRP-81-10) Final Rpt. FHWA-IN/81/10, July 1981, pp 223p
HP&R 1(18) Part II

Order From: NTIS PB82-203175

349985

ANALYSIS OF EFFECTS OF EGR ON FUEL ECONOMY

Effects of EGR on fuel consumption were analyzed quantitatively in terms of fuel economy improvement and deteriorating factors through experiments as well as thermodynamic calculations. To examine the effects of combustion duration on fuel economy under heavy EGR, experiments were performed with three engine variations. In calculation models, changes in specific heats, heat transfer rate, and dissociation rate caused by changes in gas temperature were considered. In conclusion, it may be stated that reductions of pumping loss, cooling loss, and dissociation were found to be improving factors, where their contribution ratio was approximately 4.5:4.0:1.5. The sum of calculated fuel economy gain increased steadily as EGR increases, and reached more than 10% at 20% egr under light load condition. On the other hand, a major deteriorating factor was found to be combustion fluctuation. This combustion fluctuation could be significantly reduced by achieving a "fast burn" through increased turbulence and/or dual-point ignition.(a) (TRRL)

Nakajima, Y Sugihara, K Takagi, Y (Nissan Motor Company, Limited) *JSAE Review* No. 5, HS-032 757, July 1981, 7-14, 12 FIG, 0, 0, 6 REF

Acknowledgment: TRRL (IRRD 259986)
Order From: ESL

349986

CYCLE SIMULATION TO OBTAIN OPTIMUM PARAMETERS FOR SI ENGINE EFFICIENCY AND EMISSIONS

A computer simulation which is applied to the system theory of a four-stroke spark-ignition engine cycle has been developed in order to obtain the optimum value in engine design and operating parameters on fuel economy and emissions. Optimum value of the design parameters, such as equivalence ratio, spark-timing and mass burning rate were obtained for the minimum value of performance index which represents engine power, fuel consumption, NO, CO and HC emissions. (a) (TRRL)

Hiroyasu, H Arat, M Furukawa, O (Hiroshima University, Japan) Iida, S (Kubota Limited, Japan) *JSAE Review* No. 5, HS-032 758, July 1981, pp 15-21, 8 Fig., 2 Tab., 5 Ref.

Acknowledgment: TRRL (IRRD 259987)
Order From: Society of Automotive Engineers of Japan, Inc, 10-2 Gobancho, Chiyoda-ku, Tokyo 102, Japan

349987

IGNITABILITY OF HYDROGEN-AIR MIXTURE BY HOT SURFACES AND HOT GASES IN HYDROGEN-FUELED ENGINES

It is necessary to confirm the ignitability of hydrogen in terms of abnormal combustion of hydrogen-fueled engines and safe handling of hydrogen. In this regard, the authors have carried out experiments on the effects of the heating methods, the kinds of metal particulates and metal oxide grains on the ignitability of hydrogen-air mixture by means of model equipment, in which the mixture flowed into a constant volume combustion chamber and contacted a hot metal surface or hot gas flow, and obtained some useful results on the ignition characteristics of hydrogen-air mixture.(a) (TRRL)

Enomoto, K Furuhama, S Nishiguchi, T (Musashi Institute of Technology, Japan) *JSAE Review* No. 5, HS-032 759, July 1981, pp 23-29, 18 Fig., 1 Tab., 3 Ref.

Acknowledgment: TRRL (IRRD 259988)
Order From: Society of Automotive Engineers of Japan, Inc, 10-2 Gobancho, Chiyoda-ku, Tokyo 102, Japan

349988

ELECTRO-PNEUMATICALLY OPERATED PROPORTIONAL CLUTCH FOR SEMI-AUTOMATIC POWER TRANSMISSION

The design concept of this semi-automatic power transmission is to provide a conventional mechanical transmission with a simple clutch servomechanism. For this purpose, we have developed a new type of electro-pneumatically operated proportional mechanism which controls the clutch pedal position in proportion to the electronic signal of engine revolution and carries out the vehicle starting procedure automatically. In this paper, we show the test results of the clutch control mechanism applied to a passenger car mechanical transmission and examine the vehicle starting characteristics theoretically.(a) (TRRL)

Tanaka, H (Yokohama University, Japan) Ishihara, T (Tokyo University, Japan) *JSAE Review* No. 5, HS-032 771, July 1981, pp 31-36, 11 Fig., 3 Tab., 2 Phot., 4 Ref.

Acknowledgment: TRRL (IRRD 259989)
Order From: Society of Automotive Engineers of Japan, Inc, 10-2 Gobancho, Chiyoda-ku, Tokyo 102, Japan

349989
STUDY OF AUTOMOTIVE PANEL SWEEP STIFFNESS ANALYSIS
The automotive outer panel must be made thinner to provide for weight and cost reductions. It often happens, however, that the panel cannot be made as thin as desired due to insufficient sweep stiffness. If the panel sweep stiffness is quantitatively estimated at the clay model stage, it can provide feedback for the clay model, producing a marked effect on design. We have developed NONSHEL, a large deformation analysis program mainly for the analysis of panel sweep stiffness. It is utilized to examine the accuracy of calculation and for determining how to make appropriate models which enable accurate calculation and limited calculation time. Further, we have developed a system for easily constructing an analysis model from the diagram data of the clay model so that the designer may conduct panel sweep stiffness analysis with ease during line work.(a) (TRRL)

Katoh, H Fukuda, M (Nissan Motor Company, Limited) *JSAE Review* No. 5, HS-032 765, July 1981, pp 45-51, 14 Fig., 8 Ref.

Acknowledgment: TRRL (IRRD 259990)
Order From: Society of Automotive Engineers of Japan, Inc, 10-2 Gobancho, Chiyoda-ku, Tokyo 102, Japan

349990
SPACE IN A TRUCK CAB
Heavy-duty trucks are often required to incorporate in their cabs sufficient sleeping space to enable the crew to take a rest during long hours of driving. In addition, space must be provided for the driver to freely move inside the cab from his seat to the bed. The cab of a heavy-duty truck must have a spacious area for the crew's comfort and convenience. With a view to improving the comfort of this particular area, we have analyzed the movements of the driver inside the cab based on a survey of actual operation of trucks on the road.(a) (TRRL)

Tarato, M Matsumoto, K Hakozaki, T (Hino Motors Limited) *JSAE Review* No. 5, HS-032 761, July 1981, pp 53-59, 14 Fig., 2 Phot., 13 Ref.

Acknowledgment: TRRL (IRRD 259991)
Order From: Society of Automotive Engineers of Japan, Inc, 10-2 Gobancho, Chiyoda-ku, Tokyo 102, Japan

349999
FUEL ECONOMY-SOME EFFECTS OF DRIVER CHARACTERISTICS AND VEHICLE TYPE
The prospect that the real cost of transport fuel will continue to rise emphasises the need for conservation. Driver characteristics and vehicle efficiency are two important determinants of vehicle fuel consumption. An experiment was set up on the small road system at TRRL to examine these two factors in particular, and also to examine the contribution made to fuel consumption by other factors such as vehicle speed and passenger load. Five cars were used in the experiment, one of which was a diesel of similar performance to one of the petrol cars. Visitors to open days 1979 were asked to drive round a test circuit, once in a normal way and then, in a way they considered to be an economical way of driving. The results showed that drivers could save more than 20 per cent of fuel by driving economically (one in five gallons). In general the saving was accompanied by a reduction in mean vehicle speed, but independent of speed differences, a saving of 14.7 per cent was achieved by economical driving. The diesel car used 25 per cent less fuel than the equivalent performance petrol car when driven normally, and 34 per cent when the cars were driven economically. An extra passenger increased fuel consumption by 2 to 6 per cent. There was little difference between the average fuel economy returned by men and women drivers, although men drivers tended to give more varied results. Multiple regression analysis showed speed to be the main factor which influenced fuel consumption.(a)

Laker, IB
Transport and Road Research Laboratory, (0305-1293) Monograph NLR 1025, HS-033 103, 1981, 26p, 12 Fig., 8 Tab., 2 Ref.

Acknowledgment: TRRL (IRRD 260230)
Order From: TRRL

361002
AN ANALYSIS OF FATALITIES IN HEAVY GOODS VEHICLE ACCIDENTS
Police reports of all the 740 fatal road accidents involving heavy goods vehicles which occurred in Great Britain in 1976 have been studied. Although loss of control is briefly considered the report concentrates mainly on the need to reduce the severity of injury of all road users involved in the accidents. It is estimated that 35 per cent of fatally injured occupants of HGVs might have lived if they had worn a lap and diagonal seat belt, the main benefit being prevention of ejection. A further 12 per cent might also have lived if, as well as wearing a seat belt, the cab roof and supports had been strong enough to prevent severe crushing during overturning. As regards road users other than HGV occupants, it is estimated that, provided seat belts were worn, front under-run guards would have been of benefit to 10 per cent of all occupants killed in cars and light goods vehicles in accidents involving HGVs vehicles and rearunder-run guards of benefit to an estimated 5 per cent of fatally injured occupants. Lightweight guards fitted to the sides of HGVs could possibly prevent fatal injuries to an estimated 15 per cent of the pedal cyclists, motorcyclists and pedestrians killed by the heavy goods vehicles, mainly by preventing them from being run over. This report is a final one on the project originally described in SR 586. (Author/TRRL)

Riley, BS Chinn, BP Bates, HJ
Transport and Road Research Laboratory, (0305-1293) Monograph NLR 1033, HS-033 141, 1981, 18p, 7 Tab., 6 Phot., 9 Ref.

Acknowledgment: TRRL (IRRD 260235)
Order From: TRRL

361057
ENGINE DOWNSIZING AND NOISE
Downsizing and reduced friction loss are key themes in engines for the latest passenger cars. With the demand for a quieter vehicle interior and the increasing stringency of the external noise control standards, there is a call for engines which are quieter than the conventional ones. Ordinarily speaking, downsizing and engine noise reduction are self-contradictory. This report deals with the downsizing and friction loss reduction measures and their effects on engine noise in the new Toyota 1g and another model engine. Some discussion is made of Japanese research on engine noise reduction and the development situation in relation to various methods to reduce engine noise by downsizing methods. There is a great need for a firm commitment to the kind of noise reduction technology used for valve train systems incorporating timing belts and hydraulic lash adjusters, for the downsizing of pistons and connecting rods, as well as of crankshafts and cylinder blocks, without, however, resulting in more than minimum weight effects of such downsizing. (Author/TRRL)

Atsumi, T Nakakubo, T (Toyota Motor Company, Limited) *JSAE Review* No. 6, HS-032 810, Nov. 1981, pp 19-25, 16 Fig., 3 Tab., 7 Ref.

Acknowledgment: TRRL (IRRD 260276)
Order From: Society of Automotive Engineers of Japan, Inc, 10-2 Gobancho, Chiyoda-ku, Tokyo 102, Japan

361058
IMPROVEMENT OF COMBUSTION IN SPARK IGNITION ENGINE WITH YICS
This report concerns the introduction of the Yamaha Induction Control System (YICS), which promotes rapid combustion of fuel in spark ignition engines by forcing a swirling motion in the cylinder charge. This increases the combustion rate and reduces fuel consumption. (Author/TRRL)

Endo, Y Yamashita, R Matsumoto, H (Yamaha Motor Company, Japan) *JSAE Review* No. 6, HS-032 811, Nov. 1981, pp 27-33, 15 Fig., 2 Tab.

Acknowledgment: TRRL (IRRD 260277)
Order From: Society of Automotive Engineers of Japan, Inc, 10-2 Gobancho, Chiyoda-ku, Tokyo 102, Japan

361098
NON-RADIOLOGICAL IMPACTS OF TRANSPORTING RADIOACTIVE MATERIAL
Estimates of health effects that result from exposure to air pollutants generated during normal (accident-free) transport of radioactive materials and from accidents are provided for use in preparation of environmental impact statements. The results are presented for truck and rail modes and

uncertainties associated with these results are discussed. Since these health effects have no relation to the radioactive material being hauled, their measure is applicable to shipments of all similar weight loads. The pollutant health effects are calculated for and applicable to urban areas only while the accident health effects are averages over all population zones in the U.S.

Rao, RK (NUS Corporation) Wilmot, EL Luna, RE
Sandia National Laboratories, (TTC-0236) SAND-1703, Feb. 1982, 27p, 2 Fig., Tabs., Refs., 3 App.
Contract DE-AC04-76DP00789

Order From: NTIS

361140

THE FIELD OF VISION OF LORRY DRIVERS [HET ZICHTVELD VAN BESTUURDERS VAN VRACHTWAGENS]

From 1975 to 1979, 173 persons in the Netherlands died, because they were hit by a car turing right, which is 1,5% of the total number of fatalities. Cyclists and moped riders mainly were the victims. 87% of the accidents were caused by trucks. Though the rear view mirrors are fixed according to eec directives they leave large areas invisible for the drivers of the trucks. Some seem to have additional mirrors, but there are no national data on this. When trucks turn right or left they need a wider lane. Trucks without a rear view (80%) mostly have only one person in the cabin, the driver. All these factors leave a wide area not visible for the drivers of trucks when turning right. To improve the dangerous situation several proposals are made regarding vehicles and traffic directives, in addition to the fixing of a better rear view mirror. (TRRL) [Dutch]

Blokpoel, A Mulder, JAG
Institute for Road Safety Research Monograph NR-81-20, 1981, 72p, 5 Fig., Tabs., 19 Refs.

Acknowledgment: TRRL (IRRD 260079), Institute for Road Safety Research

361142

CHILDREN AND TRAFFIC [BARN OCH TRAFIK]

This book consists of 21 chapters written by different authors, all of whom are leading experts in the area of children and traffic safety. The subjects in this book are accident statistics, traffic education, drivers' attitude and behaviour, bicycle accidents. (TRRL) [Swedish]

Trafiksaekerhtsverket Monograph Jan. 1981, 118p, 3 Fig., Phots.

Acknowledgment: TRRL (IRRD 259883), National Swedish Road & Traffic Research Institute

361272

ROAD LIGHTING AND ACCIDENTS

Details are given of the study of possible relations existing between road lighting and accidents in the United Kingdom. Lighting quality parameters were measured along 89 1-km long sections of two-way roads where the speed limit was 48 km/h. The sections had similar surfacings and lighting installations that had not been changed for 3 years. The number of night accidents and daytime accidents was known for the same period. The analysis of these data shows that the day/night accident ratio is connected with some lighting variables and not with others. The most obvious relation found was that of average luminance where the average ratio of accidents on sections with an average luminance above the average of other sections was significantly lower. (TRRL)

Cobb, J (Transport and Road Research Laboratory) Hargroves, RA Marsden, AM (Thorn Light Limited, England) Scott, PP (Transport and Road Research Laboratory)
Bureau Control de La Cie CIE No. 50, 1980, pp 414-418, 1 Fig., 4 Tab., 7 Ref.

Proceedings of the 19th Session-Kyoto 1979-International Commission on Illumination--Publication CIE No. 50.

Acknowledgment: TRRL (IRRD 112466), Central Laboratory of Bridges & Highways, France

361331

RESEARCH PROBLEM STATEMENTS: PEDESTRIANS

Seven problem areas have been identified in the field of pedestrian safety and a priority ranking system has been devised to indicate which problems are of high, medium and low priority. The problems are as follows: signal/signing for intersection pedestrian-vehicle conflicts; modeling of pedestrian volumes for pedestrian safety and operational analysis; the relationship of sight distance and visibility to pedestrian accidents; pedestrian traffic enforcement; pedestrian access and safety improvements on arterial streets; relationship of pedestrian travel to land use and energy consumption; and the impact of highway center barriers and flyhandles on pedestrian access and safety. This communication outlines the problem, the objectives of his activities that should be performed to resolve the problem, the urgency for the work, estimated costs, related current work, the user community, the implementation of the work, and the expected effectiveness.

Transportation Research Circular No. 245, May 1982, 5p

Order From: TRB Publications Off

361523

STATISTICAL ASPECTS OF INJURY SEVERITY-3. MAKING ALLOWANCE FOR DIFFERENCES IN THE ASSESSMENT OF LEVEL OF TRAUMA

A statistical method of allowing for the assessment of injury severity is proposed and applied to a set of road accident data classified according to four sets of circumstances, five police force areas, and three severities of injury. It is concluded that appreciable improvements in the sensitivity of analysis can be obtained by allowing for possible differences in the grading of injury severity.

Hutchinson, TP (University College, London) Lai, PW *Transportation Science* Vol. 15 No. 4, Nov. 1981, pp 297-305, 11 Ref.

Acknowledgment: EI
Order From: ESL

361534

WET WEATHER ACCIDENTS AND PAVEMENT SKID RESISTANCE

The problems in relating pavement skid resistance to accidents have been reviewed. A friction potential has been defined and a hypothetical relationship has been suggested.

Hegmon, RR *Public Roads* Vol. 45 No. 2, Sept. 1981, pp 68-74, 26 Ref.

Acknowledgment: EI
Order From: ESL

361576

GUIDELINES FOR DRIVER INSTRUCTION

Beginner drivers continue to be over-represented in road accidents, emphasizing the need for improving road safety education and driver instruction systems. As a follow-up to an earlier OECD Road Research report on Driver Instruction, published in 1976, these guidelines were developed to serve as a practical compendium for the attention of national road traffic and safety authorities, and in particular experienced driving instructors and examiners striving for innovations in instructional methods and test procedures. Based on recent research and practical experience in OECD Member countries, they review pedagogical principles and methods of driver instruction, set forth the instructional objectives to be pursued, and briefly list instructional materials and aids. Subsequently, a procedure for evaluating driver performance is put forward which fulfills the functions of modelling the instructional objectives and of assessing and diagnosing the task performance of the learner driver with respect to these objectives. Finally, the components of a systematic instruction programme are considered and a complete driving school curriculum is developed comprising in-car training as well as classroom teaching units. Three Appendices review national activities and present examples of contemporary driver instruction systems and evaluation/examination procedures. (Author)

Organization for Economic Cooperation and Devel Mar. 1981, 85p, Phots., Apps.

Order From: Organization for Economic Cooperation and Devel, 2 rue Andre Pascal, Paris 75775, France

361577

METHODS FOR EVALUATING ROAD SAFETY MEASURES

The Road Research Group on "Methods for Evaluating Road Safety Measures" was established to review the most appropriate techniques for the assessment of the effectiveness of safety measures and the determination of their relative priorities. The study, in which experts from 15 countries participated, examines the issue of identifying traffic safety measures in the present context of policy and decision-making in this field, and sets forth the various criteria for assessing their impacts. The major part of this study is devoted to methods of determining effectiveness of counter-measures as well as techniques of evaluation and priority setting. The Group also attempted to review current use of evaluation procedures in Member countries, presenting a number of examples of evaluations recently carried out. The report ends with a list of conclusions and recommendations for those responsible for decision-making in the field of traffic safety and the implementation of accident countermeasures as well as a compilation of further research needs. (Author)

Organization for Economic Cooperation and Devel June 1981, 108p, Figs., Tabs., 2 App.

ORDER FROM: Organization for Economic Cooperation and Devel, 2 rue Andre Pascal, Paris 75775, France

361583

ROOF-MOUNTED LIGHT SYSTEMS ON POLICE VEHICLES

Tests conducted by several different agencies have indicated that removal of roof-mounted light bars (visabars) from police cars can result in reduced fuel consumption by those vehicles. Analysis of accidents involving patrol units by the California Highway Patrol and the Illinois Department of Law Enforcement have indicated that roof-mounted light bars plays no measurable role in reducing accident potential of state police patrol vehicles. Illinois State Police experience further indicates that unmarked units are actually less likely than marked units to incur accidents. For vehicles involved in accidents, the experience of marked and unmarked units is very similar with regard to a variety of factors including type of roadway, lighting conditions, accident severity, activity prior to accident, and whether or not emergency lighting systems were in use. By removing the roof-mounted equipment from the approximately 1000 marked vehicles operated by the Illinois Department of Law Enforcement, fuel costs can be reduced by 237,000 dollars a year in terms of current fuel prices. The cost of replacement equipment would be repaid by reduced fuel consumption within four months of conversion. Removal of this equipment would also result in improved vehicle acceleration and greater top speed. Data indicate that no increase in accident rates should result from removal of the visabars. (Author)

Illinois Department of Law Enforcement Feb. 1982, 42p, 12 Tab., 5 App.

361584

ABSTRACTS AND REVIEWS IN ALCOHOL AND DRIVING

Abstracts & Reviews in Alcohol & Driving covers the recently published literature on the subject of alcohol as it affects the driving of motor vehicles. The Reviews section includes original papers on alcohol and driving, reviews of allied fields, and critiques of published papers. This issue contains the following articles: Traffic Accidents and Drunken Driving: The Problem as Seen in Public Opinion Polls (T.L. Cameron), Chronicles of a Grass-Roots Organization: Mothers Against Drunk Drivers (MAOD) (C. Lightner); and The Grass-Roots Movement Against Drinking-Driving (J.R. Gusfield). Areas covered by the Abstracts section include Medical and biological studies of the effects of alcohol on driving skills, the psychological and social portrait of the drinking driver, educational programs designed to prevent the occurrence of drunken driving, law enforcement programs, and statistical studies of traffic accidents attributed to alcohol.

Abstracts & Reviews in Alcohol & Driving Vol. 2 No. 12, Dec. 1981, 16p, Refs. Funded by a grant from the Anheuser-Busch Foundation.

361623

HEAD INJURIES: AN INTEGRATED APPROACH

This book contains the proceedings of a national symposium: Head Injuries--A Preventable Epidemic, held in Sydney, Australia, 1979. Relevant papers presented at the symposium were: The Mechanics and Prevention of Injuries to the Head (McLean, AJ); Head Injuries--Not a Preventable Epidemic (Selecki, BR); Head Injuries in Road Accidents: Some Causes and Remedies (Arthurson, RM); Compensation--A Costly Handicap to Injury Control (Wigglesworth, EC). (TRRL)

Dinning, TAR, Editor Connelley, TJ, Editor McLean, AJ Selecki, BR Arthurson, RM Wigglesworth, EC
Wiley (John) and Sons Limited Monograph 1981, 266p, Figs., Tabs., Phots., Refs.

ACKNOWLEDGMENT: TRRL (IRRD 255178), Australian Road Research Board

361624

NATIONAL SEMINAR ON THE TRANSPORT OF DANGEROUS GOODS, CANBERRA, 13-14 MARCH 1980. PAPERS AND PROCEEDINGS

The seminar was jointly sponsored by the Department of Transport Australia and the Transport Industries Advisory Council. Relevant papers presented include the following: Transport of Dangerous Goods in Australia--The Dimension of the Problem: Paper 1 (Wilding, JF); Transport of Dangerous Good in Australia--The Dimension of the Problem: Paper 2 (Kolm, JE); Regulation of the Transport of Dangerous Goods--Constitutional and Legal Possibilities in the Federal System: Paper 1 (Brazil, P); Regulation of the Transport of Dangerous Goods--Constitutional and Legal Possibilities in the Federal System: Paper 2 (Sammon, RP); The Transport Task--Practice and Regulation (Marks, LE); Regulation of the Transport of Dangerous Goods--A Government Authority View (Blackmore, H); Transport of Dangerous Goods--Problems at the Modal Interface: Paper 1--Road Transport Industry Viewpoint (Uniacke, GC). (TRRL)

Wilding, JF Kolm, JE Brazil, P Sammon, RP Marks, LE (Brambles Holdings Ltd) Blackmore, H (New South Wales Department Of Industry And Tech) Uniacke, GC (Australian Road Transport Federation)
Australian Government Publishing Service Monograph 1981, 143p, Figs., 9 Ref.

ACKNOWLEDGMENT: TRRL (IRRD 255180), Australian Road Research Board

361625

ALCOHOL IN PEDESTRIAN ACCIDENTS

This report consists of two parts. The first is a literature review of research into pedestrian accidents, alcohol-involvement in road accidents and especially, alcohol involvement in pedestrian accidents. The second is a study of victorian pedestrian accident records for the years 1977-79 to establish the extent of alcohol involvement in these accidents. (Author/TRRL)

Jordon, PW *Civil Engineering Working Paper* Monograph No. 81/4, Jan. 1981, 105p, 23 Fig., 44 Tab., 70 Ref.

ACKNOWLEDGMENT: TRRL (IRRD 255186), Australian Road Research Board

361629

A CRITICAL APPRAISAL OF ROAD LIGHTING AND ACCIDENT STUDIES

This report critically reviews many previous studies of the relationship between road lighting and accidents. The eleven original investigations identified in the literature are examined with respect to site selection, the measures used to quantify accidents and lighting, the type of accident comparisons made and the statistical techniques used to draw conclusions from the data. Inadequacies in the studies are discussed and the policy and research implications of these findings are identified. (Author/TRRL)

Vincent, EN (Victoria Country Roads Board, Australia) *Civil Engineering Working Paper* Monograph No. 81/3, Jan. 1981, 26p, 3 Tab., 35 Ref.

ACKNOWLEDGMENT: TRRL (IRRD 255192), Australian Road Research Board

361633

EFFECT OF SEAT BELTS AND HEAD RESTRAINTS ON NECK INJURY

While there is strong evidence that seat belt wearing reduces the incidence of severe injuries to vehicle occupants involved in crashes, there is also evidence that the use of lap/sash seat belts increases minor and moderate neck injuries in crashes. In recent years, head restraints have been installed in the front seats of cars with the aim of reducing minor neck injuries ("whiplash"), principally in rear impacts where their frequency of occurrence is highest. This study examined the interaction between static lap/sash belt use and the availability of head restraints installed under Australian Design Rule 22 (ADR 22), in terms of their effect on neck injury. ADR 22 allowed either fixed or fully height-adjustable head restraints, and many of the adjustable type are not set in the correct position in practice. There was no statistically significant evidence for such an interaction. However there was some evidence that the effect of seat belt use on neck injury severity is smaller when ADR 22 head restraints are available, compared with the belt effect on occupants of pre-ADR 22 cars. ADR 22 head restraints appeared to decrease the risk of whiplash injury, but increase the risk of moderate-to-critical neck injury, especially among static lap/ sash belt users and possibly among non-users as well. It was concluded that ADR 22 head restraints as used in practice are not suitable as a countermeasure to the negative effects of lap/sash seat belt use on neck injury. (TRRL)

Cameron, MH (Cameron (MH) and Associates)
Australian Office of Road Safety Monograph NCR 19, May 1981, 27p, 12 Tab., 25 Ref.

Acknowledgment TRRL (IRRD 255197), Australian Road Research Board

361634

CHILDREN WEARING APPROVED RESTRAINTS AND ADULTS' BELTS IN CRASHES

This report is based upon an in-depth study (impact 7) of 73 children who occupied cars in 231 crashes on New South Wales roads. The crashes were reported to involve children who were transported from the scene by ambulance. The study focused on restrained children under eight years of age. This was in view of legislation which provided legal impetus from March, 1977 in New South Wales for children to wear adult belts or child restraints of a type approved by the Standards Association of Australia if available when travelling in passenger vehicles. Children in approved child restraints were afforded very good crash protection in often severe crashes when their restraints were installed correctly and not loaded directly by other parts of their vehicles. One child died when her child seat was broken from behind by boot luggage and the dislocated car rear seat back. Three point emergency locking retractor and lap/sash seat belts also provided very good protection. One fatality however was reached by deep side vehicle intrusion, and another occurred when the loose sash strap of a lap/sash belt lay across the face of a child. Lap belts were ineffective for two fatalities because of a lack of control of excursion and possibility of ejection. There was little doubt that the five children would have died if unrestrained. (Author/TRRL)

Corben, CW Herbert, DC
New South Wales Dept of Motor Transport, Australia, (0313 2854) Monograph No. 81, Jan. 1981, 53p, 1 Fig., 6 Tab., 17 Phot., 12 Ref.

Acknowledgment TRRL (IRRD 255198), Australian Road Research Board

361666

THE POTENTIAL FOR ROAD ACCIDENT REDUCTION IN DEVELOPING COUNTRIES

This paper illustrates the seriousness of the road accident problem in countries of the third world by examining the cost of these accidents and also by comparing road accident fatalities with other causes of death. The paper then attempts to answer the largely hypothetical question, 'if fatality and injury rates are thought to be too high at present in these countries, to what level could they be realistically reduced?' results from the various methods used suggest that existing numbers of deaths and injuries could be reduced by between 30 and 40%, thus saving 40 000 to 50 000 lives in the third world each year. A comparison of those countries with particularly high fatality rates with those with particularly low rates showed that factors such as drinking and driving legislation and level of medical facilities available may be playing an important role in reducing fatality rates. The paper stresses the need for careful monitoring of remedial measures when introduced and an assessment made of their cost-effectiveness. In this way it is hoped that scarce financial resources are not wasted and that a greater understanding is built up of the effectiveness of road safety countermeasures in developing countries. (Author/TRRL)

Jacobs, GD (Transport and Road Research Laboratory) *Transport Review* Vol. 2 No. 2, Apr. 1982, pp 213-224, 3 Fig., 1 Tab., 11 Ref.

Acknowledgment TRRL (IRRD 261053)

361667

MEASURING DRIVING KNOWLEDGE

Several new driving knowledge tests and a conventional written test are compared with respect to their correlations with real driving performance. It is found that a theoretical knowledge test, using slides of simple real-traffic situations, correlates higher with real driving performance than the conventional test. Therefore, as a licensing device, it is recommended to use the described slide test instead of written multiple choice tests. (Author/TRRL)

Veling, IH *Accident Analysis and Prevention* Vol. 14 No. 2, HS-033 046, Apr. 1982, pp 81-85, 1 Fig., 3 Tab., 6 Ref.

Acknowledgment TRRL (IRRD 261054)
Order From ESL

361668

NIGHT-TIME LEGIBILITY OF TRAFFIC SIGNS: CONDITIONS ELIMINATING THE EFFECTS OF DRIVER AGE AND DISABILITY GLARE

The effects of observer age and environmental glare on night-time legibility of traffic signs were investigated in two field experiments with the subjects driving or riding in a car towards a sign. Experiment 1 showed that equating older and younger subjects in terms of their luminance/high contrast visual acuity resulted in elimination of any age effects on legibility. Furthermore, the presence of a glare source with an illuminance of 0.17 or 0.017 lux offset 2 degrees from the sign legend improved legibility distance significantly. The results of experiment 2 indicated that a glare source with an illuminance of 0.0098 lux had no effect on legibility when presented at an offset angle of 1.5 degrees or 0.6 degrees, but it had a significant detrimental effect at an offset angle of 0.2 degrees. The present findings suggest that (1) the usually observed age-related performance decrement on night-time legibility tasks is the result of visual-acuity deficits, and not shortcomings in information-processing ability; (2) legibility is relatively unaffected by glare, unless the glare angle is very small or glare level very high; and (3) glare sources positioned outside of the fovea might improve night-time legibility performance under certain conditions. (Author/TRRL)

Sivak, M Olson, PL *Accident Analysis and Prevention* Vol. 14 No. 2, HS-033 045, Apr. 1982, pp 87-93, 5 Tab., 10 Ref.

Acknowledgment TRRL (IRRD 261055)
Order From ESL

361669

LOWER EXTREMITY INJURIES IN AUTOMOBILE CRASHES

The New United Stated Crash Severity Study (NCSS) data on tow-away automobile crashes was reviewed to determine the details of the more severe injuries of the lower extremity. This review includes the frequency of injury by limb segments (pelvis, thigh, knee, leg and ankle/foot), the vehicle structure contacted to produce these injuries, and the injuries/contact differences among car occupants. Some of the finds are: of the various body regions having the more severe injuries, the lower extremity ranks second only to the thorax; lap-shoulder belted occupants hardly ever sustain the more severe lower extremity injuries; and severe lower extremity injuries occur primarily in frontal crashes. Extrapolation of the NCSS data for national estimates indicates that the more serious lower extremity injuries in car crash survivors approximately equals the total number of passenger car occupants who are killed annually (27,000). (Author/TRRL)

Hvelke, DF O'Day, J States, JD *Accident Analysis and Prevention* Vol. 14 No. 2, HS-033 048, Apr. 1982, pp 95-106, 2 Fig., 8 Tab., 27 Ref.

Acknowledgment TRRL (IRRD 261056)
Order From ESL

361670

SIMPSON'S PARADOX. AN EXAMPLE USING ACCIDENT DATA FROM THE STATE OF TEXAS

It is shown that the probability of an occupant fatality given a crash in a single-vehicle accident is independent of vehicle size in an aggregate data set. When the data set is partitioned into 2 occupant age groups, it is seen that both of the age groups have higher fatality rates in smaller cars. This is discussed as an example of a paradox presented by Simpson in his 1951 paper. (Author/TRRL)

Smith, K O'Day, J *Accident Analysis and Prevention* Vol. 14 No. 2, Apr. 1982, pp 131-133, 1 Fig., 2 Tab., 3 Ref.

Acknowledgment TRRL (IRRD 261057)

361671

EFFECTS OF TRAFFIC SIGNAL INSTALLATION ON ACCIDENTS

A before-and-after accident study of 31 recently signalized intersections within the City of Milwaukee was performed, using three years of accident data before along with at least two and usually 3 years of data after signalization. City-wide volume and accident trends were used as a control to adjust the data. Upon signalization, little or no change was noted overall either in the number of accidents, or in severity as measured by property-damage-only-equivalent (PDOE) and/or severity index (SI). A significant decrease of 34 per cent in the number of "right-angle" accidents was accompanied by a significant increase of 37 per cent in "rear-end" accidents (including side-swipes) and a significant increase of 41 per cent in "other" (head-on, vehicle/bicycle, fixed-object, etc.) accidents. "Vehicle/pedestrian" and "opposing direction--one turning left" type accidents did not change significantly. Various parameters involving geometrics, traffic control and vehicular volumes were analyzed. These parameters appeared to have little effect on the change in both number and severity of accidents upon signalization of the intersections in this study. A significant shift in accident severity was noted, however, between periods of flash and normal operation. Without significant changes in the number of accidents, the PDOE accidents increased 42 per cent during flash, with a corresponding decrease of 8 per cent during normal operation. (Author/TRRL)

Short, MS Chang, CJ Woelfl, GA *Accident Analysis and Prevention* Vol. 14 No. 2, HS-033 044, Apr. 1982, pp 135-145, 1 Fig., 3 Tab., 11 Ref.

ACKNOWLEDGMENT: TRRL (IRRD 261058)
ORDER FROM: ESL

361672
EFFECT OF WHEEL SLIP ON THE STABILITY AND STOPPING ABILITY OF A ROAD VEHICLE

The effects of a road vehicle's front and rear wheel slips on its stability and stopping ability under different conditions are studied. A simple in-plane model of a road vehicle is employed. The vehicle parameters used for simulation are those of a commercial vehicle. Two road conditions have been considered. During a given braking manoeuvre front and rear wheel slips are kept constant. From the results of digital simulation it is observed that even when both front and rear wheels are locked the vehicle will become unstable when there is a yaw angle disturbance at the beginning of a braking manoeuvre. Optimum slip ranges are determined for various road and speed conditions. (Author/TRRL)

Sankar, S (Concordia University, Montreal) Guntur, R (Union College, Schenectady) Sankar, TS (Concordia University, Montreal) *International Journal of Vehicle Design* Vol. 3 No. 1, HS-032 976, Feb. 1982, pp 77-89, 13 Fig., 1 Tab., 6 Ref.

ACKNOWLEDGMENT: TRRL (IRRD 260440)
ORDER FROM: Inderscience Enterprises Limited, La Motte Chambers, St Helier, Jersey, England

361673
SIMULATION OF VEHICLE COLLISIONS USING SCALE MODELS- ANALYSIS OF FRONTAL AND SIDE IMPACTS

Collision experiments using model vehicles are considered to simplify the processes and to minimize costs compared to experiments using full-scale vehicles. We fabricated model vehicles placing priority on the analysis of the vehicles' behaviour during impact, and performed impact experiments with model vehicles for various types, then compared the crashworthiness with that of full-scale vehicles. The results of these experiments have proved that the crashworthiness of model vehicles corresponds considerably to that of full-scale vehicles and the impacts of model vehicles can simulate those of full-scale vehicles. These results indicate that experiments using model vehicles are a very effective means of estimating the vehicle crashworthiness at impact. (TRRL)

Ohmae, H (Japan Automobile Research Institute) Kurihara, K (Musashi Institute of Technology, Japan) Okami, Y (Keio Gujuku University) Morisawa, M Sato, TB *International Journal of Vehicle Design* Vol. 3 No. 1, HS-032 975, Feb. 1982, pp 61-76, 11 Fig., 1 Tab., 1 Phot., 11 Ref.

ACKNOWLEDGMENT: TRRL (IRRD 260441)
ORDER FROM: Inderscience Enterprises Limited, La Motte Chambers, St Helier, Jersey, England

361674
AIRFLOW MANAGEMENT IN FUTURE DESIGN

Ford's Probe III research vehicle was created as a result of a research project aimed at integrating optimum aerodynamic efficiency and aesthetics. Extensive wind tunnel tests demonstrated that a semi-fastback body shape with a fully covered underbody performed best. The elimination of all protrusions and gaps between the glass and sheet metal surfaces has resulted in high air velocity in this area. Spoilers are employed at the rear of the car to force the air into a favourable separation behaviour. The result is that airflow disruption is avoided. The exterior mirrors were designed with an integral aerofoil profile in the lower area of the plastic housing. This ensures that there is only a short turbulence wake behind the mirror. A movable Venturi belly pan further reduces the Probe III's drag coefficient. (Author/TRRL)

Bahnsen, U (Ford of Europe, England) *International Journal of Vehicle Design* Vol. 3 No. 1, HS-032 973, Feb. 1982, pp 40-47, 6 Fig., 2 Phot.

ACKNOWLEDGMENT: TRRL (IRRD 260442)
ORDER FROM: Inderscience Enterprises Limited, La Motte Chambers, St Helier, Jersey, England

361675
COMPUTER-AIDED EXPERIMENTAL SYSTEM FOR VEHICLE DEVELOPMENT

In vehicle design and development, shortening developmental periods, improving efficiency, and improving vehicle quality have been important subjects in past years. With these objectives in mind, the Vehicle Design and Development Department, Nissan Motor Co., has been utilizing computers for CAD/CAM, CAE (Computer Aided Experiments), SA (Structural Analysis), EIM (Engineering Information Management), etc., and has been obtaining good results. The present paper describes the purpose and manner of introducing CAE to the design and development process. It also outlines an on-line system for vehicle performance tests, noise and vibration analysis, heat resistance tests, brake and engine performance tests, exhaust emission analysis, etc., which is a hierarchical structure system incorporating three host computers and twenty-seven mini-computers. Finally, the future use of the CAE system is discussed. (Author/TRRL)

Yagi, T (Nissan Motor Company, Limited) *International Journal of Vehicle Design* Vol. 3 No. 1, HS-032 972, pp 21-39, 17 Fig., 4 Tab., 5 Ref.

ACKNOWLEDGMENT: TRRL (IRRD 260443)
ORDER FROM: Inderscience Enterprises Limited, La Motte Chambers, St Helier, Jersey, England

361676
DEVELOPMENT TRENDS FOR FUTURE PASSENGER CARS

The passenger car of the future will have to meet the demands for less energy consumption, lower exhaust-gas emissions, lower noise levels, more safety for occupants and other traffic-mix constituents. At the same time, present performance levels should be maintained, as should the relative share the automobile takes of the cost of living in industrialized societies. This means that we must find development tasks that are aimed at simultaneous compliance with as many of these demands as possible, while they should not lead to adverse effects on any of the other requirements to be met by the vehicle. This paper describes the developments in the areas of automobile structure and powerplant that are geared towards these objectives. The conditions discussed are those that would permit the successful use of unconventional fuels, new types of powerplants and modified traffic systems. (Author/TRRL)

Seiffert, U Walzer, P (Volkswagenwerk AG) *International Journal of Vehicle Design* Vol. 3 No. 1, HS-032 971, Feb. 1982, pp 3-20, 11 Fig., 4 Tab., 7 Phot.

ACKNOWLEDGMENT: TRRL (IRRD 260444)
ORDER FROM: Inderscience Enterprises Limited, La Motte Chambers, St Helier, Jersey, England

361683
NON-JUNCTION ACCIDENT RATES AND THEIR USE IN 'BLACK-SPOT' IDENTIFICATION

This article outlines further research on Lothian region accident data to determine the relationship between accidents and traffic on road links categorised by both roadside development and type of carriageway. The method uses regression equations to provide expected annual average accident totals; the difference between the observed and expected totals can then be calculated. A diagrammatic representation is presented in the form of four inter-related graphs permitting an estimation of the number of accidents that can be attributed to chance fluctuations. Strong statistical evidence is given to suggest that non-junction accidents and road traffic are related and accident rates vary according to the type of roadside development. These rates can be used to predict accident totals, and thus when compared with observed totals, an estimation can be made of whether the frequency of accidents at given locations is greater or less than could be reasonably expected. The use of potential accident reduction as a ranking criterion is more likely to maximise the cost-effectiveness of a road safety programme than the use of accident rate or accident total as the ranking coefficient. (TRRL)

McGuigan, DRD (Lothian Regional Council) *Traffic Engineering and Control* Vol. 23 No. 2, HS-033 020, Feb. 1982, pp 60-65, 1 Fig., 6 Tab., 4 Ref.

ACKNOWLEDGMENT: TRRL (IRRD 260456)
ORDER FROM: Printerhall Limited, 29 Newman Street, London, England

361684
LOOP SENSORS FOR VEHICLE CLASSIFICATION
Laboratory and field tests have been carried out to improve loop sensor performance in vehicle classification under free-flow traffic conditions. The loops are used with the TRRL microprocessor system to classify vehicles according to length wheelbase and chassis height. Problems occur in distinguishing between cars and certain goods vehicles when lane discipline is poor. An outline is given of the operating principles of loop detection showing how the components of the magnetic field are utilised to detect lateral and vertical characteristics of the passing vehicles. The merits of several different loop configurations including hexagonal loops, double triangular loops and double and single rectangular loops are discussed. Laboratory experiments showed that it was not possible to produce an ideal single loop and that the reliable detection of bicycles was not simple. Loop selection depends upon the most desirable characteristics required and it was thought that the double rectangular loop, with a 200mm separation between the central conductors, was the best for detecting high sided articulated vehicles with good resolution of the chassis heights of cars, vans and medium goods vehicles. (TRRL)

Davies, P Salter, DR Bettison, M (Nottingham University, England) *Traffic Engineering and Control* Vol. 23 No. 2, HS-033 021, Feb. 1982, pp 55-59, 9 Fig., 4 Ref.

ACKNOWLEDGMENT: TRRL (IRRD 260457)
ORDER FROM: Printerhall Limited, 29 Newman Street, London, England

361689
THE APPLICATION OF SMEED'S EQUATION FOR ROAD ACCIDENTS IN GREECE
A statistical analysis of data from a 14-year record concerning the relationship between fatal road accidents and number of registered vehicles in Greece showed that such a relation could be described at a fairly good degree of accuracy by Smeed's equation. It is apparent that if the above equation would be used to estimate future road accidents in Greece an increased value for the constant coefficient should be used. (Author/TRRL)

Pitsiava-latinopoulou, M Tsohos, G *Accident Analysis and Prevention* Vol. 14 No. 1, HS-032 933, Feb. 1982, pp 1-6, 2 Fig., 3 Tab., 8 Ref.

ACKNOWLEDGMENT: TRRL (IRRD 260482)
ORDER FROM: ESL

361690
CORRELATION BETWEEN EEG AND DRIVER'S ACTIONS DURING PROLONGED DRIVING UNDER MONOTONOUS CONDITIONS
Prolonged driving under monotonous conditions decreases the vigilance of the human controller and his performance of the driving task. Variations of his control activity (vehicle related signals) were measured with the goal of receiving criteria for a warning device, which could improve the active safety of today's traffic. The investigations were performed on a rural circuit and on a driving simulator; the control variable for decreasing vigilance was the electro-encephalogram of the test subjects. Factor analysis and canonical correlation were used to investigate the relation between both data sets. The EEg parameters showed a frontal displacement under prolonged driving: thus a decreasing vigilance could be confirmed. Simultaneously the subjects' control activity in the tracking task became coarser. The accelerator pedal activity--which is a relatively free control variable-decreased with the test duration despite constant driving speed. This was explained with increased risk-acceptance at decreased performance or decreased vigilance. (Author/TRRL)

Lemke, M *Accident Analysis and Prevention* Vol. 14 No. 1, HS-032 934, Feb. 1982, pp 7-17, 16 Fig., 4 Phot., 5 Ref.

ACKNOWLEDGMENT: TRRL (IRRD 260483)
ORDER FROM: ESL

361691
RELATIONSHIPS BETWEEN ROAD ACCIDENTS AND HOURLY TRAFFIC FLOW, I ANALYSIS AND INTERPRETATION
This research extends the investigation of the relationships between measures of accidents and traffic flow, and considers the hourly flow instead of the average daily traffic (ADT), which has already been reported. The findings of this study serve as a basis for further clarification of the interactions between various levels of traffic flow and road accidents. Eight four-lane road sections were studied during an 8-year period, providing adequate data based on carefully predefined criteria. Power functions are fitted and classified according to: (1) time-sequence analysis for each roadway section; and (2) cross sectional analysis on a one year basis. The results are presented, separately for multi and single vehicle accidents, in a matrix-format. A linear dependency was observed between the power and the logarithm of the multiple constant. This was done in a similar fashion to the previously reported study of the relationships between road accidents and ADT. The results for each type of analysis and type of accident are discussed, and three examples of a practical application are given. (Author/TRRL)

Ceder, A Livneh, M *Accident Analysis and Prevention* Vol. 14 No. 1, HS-032 935, Feb. 1982, pp 19-34, 8 Fig., 3 Tab., 11 Ref.

ACKNOWLEDGMENT: TRRL (IRRD 260484)
ORDER FROM: ESL

361692
RELATIONSHIPS BETWEEN ROAD ACCIDENTS AND HOURLY TRAFFIC FLOW, II PROBABILISTIC APPROACH
This is a continuation of the investigation into relationships between accident rate and hourly traffic flow as outlined in part I of the research. The underlying study attempts to determine appropriate models for single-and multi-vehicle accident rates in conjunction with free-flow and congested-flow conditions. For the free-flow data, the total accident rate-hourly flow curve follows the u-shaped configuration. This form is the result of a convex downward and a convex upward curve for single-and multi-vehicle accidents, respectively. For the congested-flow data (characterized by multi-vehicle accidents), the accident rate increases sharply with hourly flow. The models are applied to probabilistic aspects with consideration of a fitted, generalized (hourly flow dependent) headway model. The headway model represents the probability that two vehicles which are, even instantaneously, under a car-following mode are in a potentially hazardous situation. The approach investigated is believed to provide an essential input for both simulation studies and theoretical models of road traffic accidents. (Author/TRRL)

Ceder, A *Accident Analysis and Prevention* Vol. 14 No. 1, HS-032 936, Feb. 1982, pp 35-44, 6 Fig., 10 Ref.

ACKNOWLEDGMENT: TRRL (IRRD 260485)
ORDER FROM: ESL

361693
A SYSTEM FOR THE ALLOCATION OF SAFETY RESOURCES ON A ROAD NETWORK
This paper presents a complete allocation methodology of resources for safety improvements of a road network. In the first part of the paper, a set of models is estimated to identify so-called "black spots" in the road network. In the second part of the paper, a linear programming (lp) model is defined for the allocation of a total budget to those projects which ensure the most cost-effective results in reducing road accidents. The specific solution method for the allocation lp problem is defined, and its superiority to a cost-benefit analysis for budget allocation is shown through a real world example. (Author/TRRL)

Mahalel, D Hakkert, AS Prashker, JN *Accident Analysis and Prevention* Vol. 14 No. 1, HS-032 937, Feb. 1982, pp 45-56, 4 Tab., 11 Ref.

ACKNOWLEDGMENT: TRRL (IRRD 260486)
ORDER FROM: ESL

361694
DO ACCIDENT-INVOLVED DRIVERS EXHIBIT RISKIER EVERYDAY DRIVING BEHAVIOUR?
For more than forty years researchers have tried to relate traffic accident involvement to how an individual normally drives. Such efforts have not

hitherto discovered clear effects. This study establishes statistically significant relations between prior involvement in accidents and an observed characteristic of every day driving. The observed driving characteristic is following headway in high flow freeway traffic, defined as the time interval between a vehicle and the preceding vehicle in the same lane. This headway is interpreted as a measure of driver risk. It is found that accident-involved drivers are more likely to follow with short headways (less than 1 s) than accident-free drivers. A similar effect is found in comparing drivers with and without traffic violations. Records of accident involvement and traffic violations were obtained (with the cooperation of the Michigan department of state) for 2576 unidentified drivers observed travelling on a local freeway in high flow afternoon rush hour traffic. The observational data consisted of a measure of the headway and a photograph of each vehicle from which the license plate number was read. In most cases the license plate number provided the driver license number of the registered owner. Cases were excluded if the sex and age of the driver observed in the photograph did not match the owner information. The traffic violation and accident records available from the driver license file were used to examine following headway as a function of driver record. Based on their observed closer following in freeway traffic it is concluded that accident-involved drivers and drivers cited for violations exhibit higher levels of risk in everyday driving than accident-free and citation-free drivers. (Author/TRRL)

Evans, L Wasielewski, P *Accident Analysis and Prevention* Vol. 14 No. 1, HS-032 938, Feb. 1982, pp 57-60, 6 Fig., 5 Tab., 12 Ref.

ACKNOWLEDGMENT: TRRL (IRRD 260487)

361695

ACCIDENT RISK IN ROAD TRAFFIC-CHARACTERISTIC QUANTITIES AND THEIR STATISTICAL TREATMENT

The different cases of applying relativized quantities to accident research are discussed; a systematic approach to the use of exposure quantities is developed. Special attention is paid to the question of which kind of quantities are suitable to be used in order to form risk characteristics and also to the problem, under which conditions this reference quantity is to be regarded as a random variable rather than a fixed value. For the various cases resulting from this approach, statistical methods (in part new) are discussed and examples given. (Author/TRRL)

Bruhning, E Volker, R *Accident Analysis and Prevention* Vol. 14 No. 1, HS-032 939, Feb. 1982, pp 65-80, 1 Tab., 36 Ref.

ACKNOWLEDGMENT: TRRL (IRRD 260488)
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361702

REBREATHING IN A SUBJECT WEARING AN INTEGRAL CRASH HELMET

The respired air of a volunteer was analysed while he was wearing a variety of integral crash helmets. Observations were made with and without a protective balaclava, bib or scarf, or both. Rebreathing occurred and the peak inspired oxygen tension fell as low as 16.0 kpa (120 mm hg) with a minimum inspired carbon dioxide of 2.1 kpa (16.0 mm hg). Accessories worn or attached to the helmet which restrict airflow into the helmet should not be used. Attention should be paid to the "air conditioning" of helmets when worn with flameproof balaclavas and bibs. (Author/TRRL)

Greenbaum, R Malins, AF Davies, R Baskett, PJF (Frenchway Hospital, Bristol) *British Medical Journal* Vol. 284 No. 6318, HS-033 055, Mar. 1982, pp 774-775, 1 Fig., 1 Tab., 8 Ref.

ACKNOWLEDGMENT: TRRL (IRRD 260606)
ORDER FROM: British Medical Association, BHA House, Tavistock Square, London WC1 H9JR, England

362017

EFFECTIVENESS OF CLEAR RECOVERY ZONES

Current highway design criteria generally include a recommendation for an unobstructed roadside area with relatively flat slopes. Satisfying this criterion often results in higher construction costs due to extra cross-section widths, increased crossroad structure lengths, and additional right-of-way. Maintenance requirements may also be affected. Objective analyses of the actual effectiveness of clear recovery areas in reducing the frequency and severity of run-off-the-road accidents are necessary in order to assure cost-effective designs. The analysis should consider both cost and safety as related to road type, average daily traffic, vehicle speed, and highway geometrics. This report documents Midwest Research Institute's study of the effectiveness of clear recovery zones. Accident and cost data were analyzed for two-lane highways, four-lane divided arterials, and four-lane freeways constructed under different roadside design policies. A cost-effectiveness methodology for choosing a roadside design and four illustrative design examples are described. The researchers found that the cost-effectiveness of roadside design improvements can vary widely between highway sections because of differences in accident rates, traffic volumes, terrain, required construction quantities, unit construction costs, and right-of-way requirements. Based on these findings, they recommended that cost effectiveness be determined on a project-by-project basis and that site-specific data be used whenever possible. In this regard, users of this report should note that the accident and cost data are from States with relatively level terrain (Illinois, Michigan, and Minnesota) and, therefore, the data should not be considered as typical or average values. The data are presented primarily to illustrate the procedural steps for others to follow using data for their own local conditions. It should also be recognized that the actual selection of roadside design involves many other considerations in addition to the cost-effectiveness analysis for a single highway section. For example, continuity of design along a route to avoid frequent changes in the cross section, compatibility of the roadside design to such other factors as horizontal curves and available right-of-way, and the feasibility of actually conducting a detailed analysis for each highway section must also be considered. Therefore, the methodology presented in this report is intended to be used as one step in the total design process recognizing that other factors also need to be fully considered. With the current emphasis on reconstruction type projects and in view of continuing increases in construction costs, selection of the most cost-effective design is a primary concern. The methodology described in this report was developed in response to this concern. (Author)

Graham, JL Hardwood, DW (Midwest Research Institute) *NCHRP Report* No. 247, May 1982, 68p, Figs., Tabs., 27 Ref., Apps.

ACKNOWLEDGMENT: National Cooperative Highway Research Program
ORDER FROM: TRB Publications Off

362048

EPILEPSY AFTER HEAD TRAUMA AND FITNESS TO DRIVE

Driving regulations in Great Britain require an epileptic private car license holder to be free of fits for three years during working hours, with or without anticonvulsant medication, before he is allowed to drive. However, the onus is on drivers to report illness which may affect their fitness to drive, which in turn must depend on advice given to them by their physicians. The three year rule makes it easy to advise patients who have already had fits, but the question of the patient with a condition which predisposes to epilepsy, such as head injury or healed brain abscess, but who hasn't had a fit, remains to be answered satisfactorily. There is also a need for more extensive data before the risks of epilepsy after intracranial surgery can be estimated accurately. Several studies seem to indicate that the use of phenytoin and sodium valproate significantly reduces the incidence of post-traumatic and post-operative epilepsy. So it seems that the dilemma for the doctor who has to advise about driving after head trauma, may be resolved in part by a more systematic and sustained attempt to prevent epilepsy by drugs.

Lancet Vol. 1 No. 8165, HS-032 779, Feb. 1980, pp 401-402

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: Little, Brown and Company, 34 Beacon Street, Boston, Massachusetts, 02106

362049

HEAVY EQUIPMENT THIEVES: THE TEN-TON WHEELER-DEALERS

Combating heavy equipment theft is not a problem for law enforcement alone. It is also a problem for insurers who are seeing more and higher theft claims; for the government, which must create effective legislation to aid law enforcement; for consumers and taxpayers through higher costs for buildings or roads; for manufacturers who are loosing markets here and abroad to thieves; for the contractor and builder in a highly competitive industry that is ruled by the lowest bid and ruined by cost overruns. It is a problem that fuels inflation and thereby touches everyone. Some of the measures taken to combat that problem are outlined in this article, along with suggestions for owners.

Lee, C *Journal of Insurance* Vol. 52 No. 6, HS-032 767, Nov. 1981, pp 27-34, Phots.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration

ORDER FROM: Insurance Information Institute, 110 William Street, New York, New York, 10038

362050
MOPEDS: THE 100 MILES PER GALLON BARGAIN. ECONOMY AND EASE ON WHEELS

This article discusses mopeds in general: they have a variety of applications, are street legal in 45 states and the District of Columbia, use very little gas, require no special training to operate, need very little maintenance. Then it gives advice on selection and safety, and follows by listing eleven different models. Each listing includes a description of the vehicle, its performance and the warranty. Each model is given a rating. The listing includes a table which indicates the make and model, engine, starter system, transmission fuel capacity, weight, tires, full suspension or not, and price of the eleven mopeds.

Consumers' Research Vol. 64 No. 12, HS-032 753, Dec. 1981, pp 18-21, Phots.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: Consumers' Research, Incorporated, Washington, New Jersey, 07882

362051
MAKING SURE THE SAFETY SEAT IS SAFE

This article lists the child safety seats which meet federal safety standards and warns consumers to make sure that the seat which they purchase is compatible with their car's design. It discusses several problems consumers might encounter when installing child safety seats and provides a list of eleven common mistakes for parents to avoid when using these restraints.

Consumers' Research Vol. 64 No. 12, HS-032 752, Dec. 1981, pp 22-24, Phots.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: Consumers' Research, Incorporated, Washington, New Jersey, 07882

362052
TRACTIVE PERFORMANCE ANALYSIS OF PART-TIME FOUR-WHEEL-DRIVE VEHICLE

The part-time four-wheel-drive system, which requires a manual shift into two-wheel drive or four-wheel drive, is widely used for off-road vehicles. Since the part-time four-wheel-drive connects the front and rear drive line directly, tractive capability, braking performance and other characteristics of the vehicle are often influenced by tire-to-road contact conditions. Especially, on a dry paved road which has high friction tire-to-road coefficient of friction, the influence becomes clearly apparent, so some restrictions on the part-time four-wheel-drive are usually recommended. This paper reviews the mechanism of the part-time four-wheel-drive on a high-friction paved road. It analyzes the tractive capability and braking performance.

Nishikura, S Usui, H Takematsu, K (Nissan Motor Company, Limited) *JSAE Review* No. 5, HS-032 760, July 1981, pp 39-44, 8 Fig., 1 Tab., 10 Ref.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: Society of Automotive Engineers of Japan, Inc, 10-2 Gobancho, Chiyoda-ku, Tokyo 102, Japan

362053
AN ANALYSIS ON THE VOLTAGE REQUIREMENT OF SPARK PLUG AND ITS EFFECT ON ELECTRO-MAGNETIC INTERFERENCE

It was clarified that there was a close relationship between the voltage requirement (spark discharge voltage) and the electromagnetic interference (EMI) for the spark discharge of the spark plug as one of the major sources of EMI along with the distributor. It was also clarified by quantitative analysis that the voltage requirement could be calculated with the combustion chamber pressure and the electrode temperature of the spark plug during time of spark ignition.

Hori, O (Toyota Motor Company, Limited) Nishikawa, K (Toyota Central Research and Development Labs) *JSAE Review* No. 5, HS-032 762, July 1981, pp 61-66, 15 Fig., 5 Ref.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: Society of Automotive Engineers of Japan, Inc, 10-2 Gobancho, Chiyoda-ku, Tokyo 102, Japan

362054
STUDY ON SPARK DISCHARGE CURRENT FOR NOISE SUPPRESSION

The ignition system of any internal combustion engine is well known as a major source of radio frequency interference, and various kinds of suppressors are adopted in order to reduce ignition interference. However, most of them are intended to decrease the spark discharge current by means of inserting resistors in the ignition circuit. Of primary importance for noise suppression is the capacitive component of ths circuit which can decrease current amplitude. In this paper the authors present for noise suppression. In this paper the authors present a theory on the capacitive current in the ignition cable, and compare it with experimental results. As a result, they have confirmed that the agreement between the theory and experiments was satisfactory to some degree and the noise current can be roughly determined from the theoretical equation. Based on these results, it is possible to collect the noise current at a part of the cable by applying the wire-wound resistor cable, and thus achieve more effective noise suppression.

Nishio, K (NGK Spark Plug Company, Limited) Suzuki, T Sugino, K *JSAE Review* No. 5, HS-032 763, July 1981, pp 69-75, 11 Fig., 1 Tab., 5 Ref.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: Society of Automotive Engineers of Japan, Inc, 10-2 Gobancho, Chiyoda-ku, Tokyo 102, Japan

362055
LEGAL SYSTEM OF JAPAN ON MOTOR VEHICLES. PART 3 ENVIRONMENTAL POLLUTION CONTROL MEASURES AND ENERGY-SAVING MEASURES FOR MOTOR VEHICLES

This paper discusses exhaust gas pollution and noise pollution caused by motor vehicles in conjunction with the legal control of motor vehicles through the enforcement of the regulations concerning their construction and equipment. Then it examines energy-saving measures concerning motor vehicles in the light of the legal regulations.

Mukai, R (Tokyo Ministry of Transport, Japan) *JSAE Review* No. 5, HS-032 764, July 1981, pp 77-91, 12 Fig., 13 Tab.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: Society of Automotive Engineers of Japan, Inc, 10-2 Gobancho, Chiyoda-ku, Tokyo 102, Japan

362056
DEVELOPMENT OF AUTOMATED ADJUSTMENT MACHINE FOR VALVE CLEARANCE OF AUTOMOBILE ENGINES

A new fully automated adjustment machine for valve clearance of automobile engines has been developed. In the machine, clearances of intake and exhaust valves at each cylinder are adjusted with screwdrivers driven by pulse motors, air motors provided with torque detector, and electric micrometers. The sequence of various adjustment processes as well as valve clearance and fixing torque are controlled and monitored by a central control unit. After adjustment the control unit performs the valve timing test. The adjustment machine brings such advantages as improvement of accuracy of valve clearance and easy detection of misassembly of parts. The machine completely eliminates the need for manual adjustment work which requires a highly skilled operator. Improved accuracy of valve clearance with the machine has contributed to a reduction of the number of readjusted engines in the production line to 1/40, reduced the noxious ingredients in the exhaust gas, and guaranteed free engine maintenance to customers.

Takase K (Toyota Motor Company, Limited) Noro, S Makino, S Naito, T *JSAE Review* No. 5, HS-032 766, July 1981, pp 93-99, 11 Fig.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: Society of Automotive Engineers of Japan, Inc, 10-2 Gobancho, Chiyoda-ku, Tokyo 102, Japan

362057
TURNING ON YOUR IGNITION SYSTEM

There are two kinds of ignition systems: the old, familiar breaker point ignition, and the more sophisticated, but mechanically simple, electronic ignition. This article gives a very detailed explanation of how both systems work, then compares one to the other: with the mechanical breaker point ignition system, it is necessary to replace the points, condensor, rotor etc., about every 10,000 miles, while with the electronic ignition system, one needs to replace only the spark plugs, rotor and perhaps the distributor cap, and this only every 20,000 to 30,000 miles, which translates to a lesser expense.

Mater, RK *Trailer Life* Vol. 42 No. 1, HS-032 778, Jan. 1982, 5p, 8 Fig.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: Trailer Life Publishing Company Incorporated, 23945 Craftsman Road, Calabasas, California, 92132

362058

SPEED ENFORCEMENT, VISIBILITY, AND EFFECTS OF TRAFFIC CONTROL MEASURES ON DRIVERS

This record contains 10 papers: (1) Effectiveness of School Speed Zones And Their Enforcement; P.T. McCoy, A.K. Mohaddes, and R.J. Haden; (2) Visibility of Circular Traffic-Signal Indications, G.F. King; (3) Standardization Of Light Signals For Road Traffic Control (Abridgment); D.A. Schreuder; (4) Construction-Zone Delineation (Abridgment); T.D. Davis; (5) Potential Adverse Impacts of Reflective Solar Spot Glare On Motorists: Seattle's Experience (Abridgment); D.K. Erickson; (6) Effects Of Turning Off Selected Roadway Lighting As An Energy Conservation Measure; S.H. Richards; (7) Operational Field Study Of Urban Freeway Guide Signing In Dallas (Abridgment); R.W. McNees and C.J. Messer; (8) Driver Knowledge Of Grade-Crossing Information; J.E. Tidwell, Jr. and J.B. Humphreys; (9) Characteristics of Urban Freeway Guide Signing In Selected Cities (Abridgment); C.J. Messer and R.W. McNees; and (10) Traffic Control And Geometrics For Weigh-In-Motion Enforcement Stations; C.E. Lee and R.B. Machemehl.

Transportation Research Record No. 811, HS-032 774, 1981, 41p, Figs., Tabs., Refs.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
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362059

MEASUREMENT OF ACCELERATION NOISE AND DISCUSSION OF THE ENERGY MODEL DEVELOPED BY DREW

To find relationships between acceleration noise and the characteristic features of the traffic flow, an investigation has been conducted including the measurement of relevant parameters. By means of the average-car method relationships between acceleration noise and traffic volume, density and mean-time speed have been found, which can be represented in form of nomograms. The results of this investigation show that the concept of internal energy of a traffic stream cannot be maintained.

Winzer, T (Karlsruhe University, West Germany) *Transportation Research. Part A: General* Vol. 15A No. 6, HS-032 754, Nov. 1981, pp 437-443, 9 Fig., Refs.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: Pergamon Press Limited, Headington Hill Hall, Oxford OX3 0BW, England

362060

SOME EXPERIENCE WITH A MULTIPLE LINEAR REGRESSION METHOD OF ESTIMATING PARAMETERS OF THE TRAFFIC SIGNAL DEPARTURE PROCESS

Before any method of data collection becomes accepted as a practical tool, it should first be widely tested. This paper analyses in detail a regression method of estimating saturation flow, effective green time and pcu values on traffic signal approaches which has previously been suggested by one of the authors. The method is applied by dividing the green time given to an approach into consecutive "first", "middle" and "last" counting periods, covering the build up to saturation flow at the start of green, the period of constant saturation flow and the fall-off of saturation flow during the amber period. To estimate parameters, the number of straight-on cars in each counting period is regressed against its length and the number of vehicles of other types departing. It is shown that the method as previously described should be modified in two ways: first, counts from amber periods should not be included in the regression when pcu values are being estimated, and second, a weighted rather than unweighted regression should be used to ensure constant variance of the error term. An optimal sampling policy which produces parameter estimates with minimum variance is described. Applications of the method to data from several sites are described. It is shown that standard errors of parameter estimates are simply related to measurable variables. This allows simple formulae for the minimum number of observations required to achieve specified accuracies to be determined. Formulae for minimum sample sizes required to detect specified differences in saturation flow are also derived. In particular, it is shown that it is most economical, in term of sample size, to use data from single lane sites when testing differences in saturation flow between different times of day. When data from more than one site are available for testing differences, a composite test can be used which reduces sample sizes at individual sites over those required when testing a single difference.

Branston, D (Greater Manchester Council, England) Gipps, P (CSIRO, Division of Building Research) *Transportation Research. Part A: General* Vol. 15A No. 6, HS-032 755, Nov. 1981, pp 445-458, 9 Fig., 6 Tab., Refs., 1 App.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: Pergamon Press Limited, Headington Hill Hall, Oxford OX3 0BW, England

362061

DISCRETE MULTIVARIATE ANALYSIS USING LOG-LINEAR MODELS

A broad class of log-linear models is discussed which contains as subsets the general linear model, the logit model, and the association model. By suitable choices of the transformation matrices, it is also possible to define additional models for which maximum likelihood estimates have not previously been obtained. The procedure presented here is not meant to replace specialized programs such as for the generallog-linear model or for the logit model. The specialized programs will generally have the capability of handling larger data sets than is possible for a general procedure like that presented here. The chief advantage of this procedure is its flexibility for defining new models. Also of importance is the obvious extentions to more complex models by alternately applying exponential and logarithmic functions separated by transformation matrices, as is done for the Grizzle-Starmer-Koch procedure.

Flowers, RJ
Texas Transportation Institute TARE-42, HS-032 756, Oct. 1981, 33p, 11 Tab., Refs., 2 App.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: Texas Transportation Institute, Traffic Accident Research and Evaluation Program, College Station, Texas, 77843

362062

WORLD MOTOR VEHICLE DATA 1981 EDITION

This statistical compilation of international motor vehicle data through 1980 includes production totals by manufacturers as well as by country. Since it is necessary to use different data sources from year to year, there are occasional differences in the number reported for various classes of vehicles for some countries. This is due to the lack of uniformity of definitions for certain vehicles. In such cases, car, truck and bus data vary from one source to another and, accordingly, in the year to year data reported. Although special efforts have been made to segregate vehicle assembly data from production data, the world totals for production may include some duplication since it is not possible for all countries to identify assemblies from production. The data in this report were supplied by foreign government agencies, trade associations, private services and the press. It should be noted that the basis on which the data are reported will vary. For example, vehicle output may be measured in terms of production, shipments, or factory sales. New vehicles sold may be measured in terms of retail sales or new registrations. Imports and exports are subject to problems of compilation and definition. As a result, data accuracies vary and international comparisons are, of course, affected by these discrepancies.

Motor Vehicle Manufacturers Assn of the U.S., Inc HS-032 786, 1981, 344p

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: Motor Vehicle Manufacturers Assn of the U.S., Inc, Communications Department, 300 New Center Building, Detroit, Michigan, 48202

362063

BURN INJURIES ASSOCIATED WITH ROAD TRAUMA

This paper details the results of an eleven-year survey of patients admitted to the burns unit at the Royal Brisbane Hospital with injuries secondary to motor vehicle accidents. There were 64 subjects in this group. Forty-five were involved in car accidents and 19 in cycle accidents. Fifty of the patients were male, with a mean age of 26.9 years. The mean age of the 14 females was 24.9 years. Petrol fires emerged as the major source of injury in those individuals involved in car accidents, while hot metal injured most of the cyclists. Cyclists did not seem to be more prone to friction burns than motorists. Burns to the limbs predominated, but respiratory burns occurred in seven of the eight patients who did not survive. The median duration of hospitalization was 21 days, and the death rate in this series was 12.5%.

Pegg, SP Mayze, TD (Royal Brisbane Hospital, Australia) *Australian and New Zealand Journal of Surgery* Vol. 50 No. 6, HS-032 782, Dec. 1980, pp 593-596, 1 Fig., 2 Tab., Refs.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: Royal Brisbane Hospital Dr Pegg (Stuart P), Herston Road, Brisbane, Queensland 4029, Australia

362064

WEAK POINTS OF CARS 1982

This book is a presentation of statistics based on the large material deriving from the periodic vehicle inspection. The presentation mainly takes the form of relative observation frequencies--percentages--for different main systems and subsystems and for different kinds of vehicles. High observation frequencies indicate "weak points" in vehicles in general as well as in particular kinds of vehicles and vehicle makes/types. Obviously, this review of observation frequencies can not be used as a basis for a complete assessment of the quality and durability of different cars, nor can it be used for an analysis of all their advantages and disadvantages. However, as far as defects with an influence on the traffic safety are concerned, the review draws the attention to components that should be watched. This year report has principally the same structure as last year's. The introduction deals with the different systems of the vehicle and figures are presented in order to describe the development since the 1960s. The special review of passenger cars includes the year models 1979, 1976, 1974 and 1972.

Swedish Motor Vehicle Inspection Company HS-032 769, 1981, 168p, Tabs., Phots., 6 App.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: Swedish Motor Vehicle Inspection Company, Box 508, S-162 15 Vallingby, Sweden

362065

BEHIND THE WHEEL TRAINING FOR INDIVIDUALS LABELED MODERATELY RETARDED

This article reports the results of research which investigated a strategy for teaching moderately mentally retarded individuals to perform skills required for driving an automobile. It was found that: (a) All skills learned in the simulator were transferred, with assistance, to the training vehicle; (b) Moderately mentally retarded individuals were trained to competently perform some of the skills found in driver education curricula; and (c) Resultant data suggest the feasibility of continuing the development of procedures for training moderately mentally retarded individuals to drive. Recommendations are made for future research.

Zider, SJ Gold, MW (Gold (Marc) and Associates, Incorporated) *Exceptional Children* Vol. 47 No. 8, HS-032 781, May 1981, pp 632-639, 3 Tab., Refs.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: Council for Exceptional Children, 1920 Association Drive, Reston, Virginia, 22091

362066

PHYSICIAN REPORTING--A NATIONAL PERSPECTIVE

This article examines the various questions raised on the topic of the physician's role in the reporting of impaired drivers. It looks at the current legal requirements of the States and examines the objections which are most often raised by physicians. It discusses the role of State medical advisory committees, deals with the question of legal liability, and raises some questions which are yet to be answered.

Gregory, DR *New York State Journal of Medicine* Vol. 80 No. 13, HS-032 780, Dec. 1980, p 1984, 19 Ref.

Symposium: Physician's Role in Highway Safety. Presented at the Continuing Medical Education Assembly of the Medical Society of the State of New York, Port Chester, New York; Committee on Accident and Injury Prevention; Sections on Orthopedic Surgery, Preventive Medicine, Radiology; and Joint Meeting with the American Association of Automotive Medicine, Saturday, April 26, 1980.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: Medical Society of the State of New York, 420 Lakeville Road, Lake Success, New York, 11040

362067

PARKING LOT ACCIDENT CHARACTERISTICS

This study examined the assumptions made by some agencies or managements that special elements may be needed in parking lots for pedestrian protection. It also studied the question as to whether a safety relationship can be found between parking angle, stall width or other variables in parking layout. Results show a very low proportion of parking lot accidents involve injuries. Pedestrian accidents represent an even smaller fraction, and special pedestrian protection within parking lots was not found to be justified. No need was found to restrict diagonal crossing of parking rows. A significant increase in accident frequency was associated with higher parking turnover activity. Finally, the 90 degree parking layout appears to offer safety advantages as compared with lesser parking angles, however further research here is needed.

Box, PC *ITE Journal* Vol. 51 No. 12, HS-032 776, Dec. 1981, pp 12-15, 8 Tab., 7 Ref.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: Institute of Transportation Engineers, 525 School Street, SW, Suite 410, Washington, D.C., 20024

362068

AN EVALUATION OF PERMISSIVE LEFT-TURN PHASING

In this study exclusive left-turn phasing was replaced with permissive left-turn phasing at four trial intersections. Intersection delay and accident studies were done before and after the trial installations. Also, a questionnaire was distributed to determine public opinion concerning the signal. Among the results of this study it was found that: permissive phasing at several locations in Lexington, Kentucky resulted in a 50 percent reduction in left-turn delay compared with exclusive phasing (total intersection delay was reduced 24 percent); permissive phasing resulted in an increase in accidents; questionnaire responses showed 90 percent of drivers in the area to be in favor of permissive left-turn phasing; signing to advise motorists of the meaning of permissive phasing is required; and advance publicity should precede installations.

Agent, KR (Kentucky University) *ITE Journal* Vol. 51 No. 12, HS-032 777, Dec. 1981, pp 16-20, 4 Fig., 4 Tab., 8 Ref.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: Institute of Transportation Engineers, 525 School Street, SW, Suite 410, Washington, D.C., 20024

362069

PROCEEDINGS OF THE TWENTY-FIFTH CONFERENCE OF THE AMERICAN ASSOCIATION FOR AUTOMOTIVE MEDICINE

This volume contains 38 papers prepared for the American Association for Automotive Medicine Proceedings, October 1-3, 1981, San Francisco, California. The papers cover the following areas: Keynote address; Motor vehicle and road-related trauma: causes and consequences; Crash investigation, reconstruction and analysis--field data; Alcohol and other drug-impaired drivers--field data; Medically-impaired drivers; Two-wheeled motor vehicles; Injury scaling; Child passenger safety; The roadway; The National Accident Sampling System (NASS); Signaling devices and driver reaction; Driver education; Mathematical modeling; and Medical and social aspects of road-related trauma.

American Association for Auto Medicine Conf Proc HS-032 773, 1981, 483p, Figs., Tabs., Refs. Proceedings of the 25th Annual Conference, San Francisco, California, October 1-3, 1981.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: American Association for Automotive Medicine, P.O. Box 222, Morton Grove, Illinois, 60053

362070

TRUCK WEIGHT ENFORCEMENT PROGRAM SAVES STATE'S ROADS AND REVENUE

This article discusses Virginia's truck weight enforcement program, pointing out its successfulness, its benefits, and also its shortcomings. Virginia law sets the maximum truck weight limit at 76,000 pounds with a five percent weight tolerance. To enforce the limit, the Virginia Department of Highways and Transportation has 14 permanent weigh stations and 9 mobile units in specially equipped vans. Two of the main problems faced at the present time are the inconsistency of the courts in assessing liquidated damages and the use of sophisticated CB radio equipment or hired scouts by truckers to avoid detection by the mobile units.

Virginia Dept of Hwys and Transportation Bulletin Vol. 47 No. 10, HS-032 768, Oct. 1981, p 4, Phots.

Acknowledgment: National Highway Traffic Safety Administration
Order From: Virginia Department of Highways and Transportation, 1221 East Broad Street, Richmond, Virginia, 23219

362071
THE DEVELOPMENT OF A PROBLEM-DRINKING DRIVER PROGRAM

The Straub Hall Alcoholism Rehabilitation Unit, Pilgrim Psychiatric Center, Brentwood, New York designed an outpatient problem-drinking driver program (PDDP) to identify and treat the beginning problem drinker and the alcoholic whose DWI or DWAI conviction showed a sustained or chronic behavior problem. This article describes the development of the PDDP from the initial step of client evaluation through the drawing up of a treatment plan contract to the final step of ascertaining the clients' reaction to PDDP. The staff training component of such a program is also briefly discussed, and preliminary findings are reported. The results of the PDDP and findings reported by others confirm the effectiveness of early intervention in the treatment of problem drinking and alcoholism. Also, treatment seems to be especially effective when there is a leverage mechanism to involve and maintain clients in treatment.

Paley, MG *Alcohol Health and Research World* Vol. 6 No. 1, HS-032 747, 1981, pp 55-57, Refs.

Acknowledgment: National Highway Traffic Safety Administration
Order From: GPO

362072
AUTOMOBILE REAR LIGHTS: EFFECTS OF THE NUMBER, MOUNTING HEIGHT, AND LATERAL POSITION ON REACTION TIMES OF FOLLOWING DRIVERS

The efficiency of 22 configurations of brake lights in actual traffic was tested in a daytime experiment by measuring reaction times of following drivers to brake signals. Analysis showed that adding supplemental (including high-mounted) lamps to conventional two-lamp configurations did not shorten reaction times. Other findings indicate that the lateral position of the lamps, the following distance, as well as the sex (6 men, 6 women) and age (19-31 yr. vs 63-71 yr.) of the 12 drivers had significant effects on reaction times, while the mounting height of the lamps did not.

Sivak, M Post, DV Olson, PL (Highway Safety Research Institute) Donohue, RJ (General Motors Corporation) *Perceptual and Motor Skills* Vol. 52 No. 3, HS-032 785, June 1981, pp 795-802, 1 Fig., 1 Tab., Refs.

Acknowledgment: National Highway Traffic Safety Administration
Order From: Highway Safety Research Institute, Dr Sivak (Michael), Huron Parkway and Baxter Road, Ann Arbor, Michigan, 48109

362073
ARE WE ALL LESS RISKY AND MORE SKILLFUL THAN OUR FELLOW DRIVERS?

In this study subjects were asked about their competence as drivers in relation to a group of drivers. The results showed that a majority of subjects regarded themselves as more skillful and less risky than the average driver in each group respectively. This result was compared with similar recent findings in other fields. Finally, the consequences for planning and risk taking of seeing oneself as more competent than others were discussed briefly.

Svenson, O (Stockholm University, Sweden) *Acta Psychologica* Vol. 47 No. 2, HS-032 784, Feb. 1981, pp 143-148, 1 Tab., Refs.

Acknowledgment: National Highway Traffic Safety Administration
Order From: North Holland Publishing Company, Box 211, 1000 AE Amsterdam, Netherlands

362074
NIGHT DRIVING (MESOPIC) VISUAL ACUITY IN SOBER MALE ALCOHOLICS WITH AND WITHOUT LIVER DISEASE

Night driving (mesopic) visual acuity and recovery after dazzle has been reported to be reduced in patients with liver disease. Mesopic visual acuity and dazzle recovery were evaluated in 32 patients with alcoholic cirrhosis, 29 alcoholics without liver disease, and 27 age-matched normal controls. All subjects were sober for at least 7 days prior to visual testing, a mean sobriety period of 22 and 39 weeks in alcoholics and cirrhotics, respectively. Serum vitamin A levels and/or dark adaptation were normal in all. Mean best decimal acuities were not significantly different among the groups: alcoholic cirrhotics, 0.32 plus or minus 0.02; alcoholics, 0.32 plus or minus 0.02; and normals, 0.33 plus or minus 0.03 at 2 min. Although cirrhotics had significantly higher SGOT and lower albumin levels than alcoholics, mesopic acuity did not relate to liver blood tests. Decimal acuity following a dazzle stimulus was not significantly worse in cirrhotics and alcoholics compared to normals. Sober patients with alcoholic cirrhosis or a history of alcoholism have no evidence of a static mesopic visual defect and therefore may not have impaired night driving vision.

Campbell, TD Sampliner, RE Russell, RM Garrett, MS *Alcoholism: Clinical and Experimental Research* Vol. 5 No. 1, HS-032 775, Jan. 1981, pp 34-37, 1 Tab., 15 Ref.

Acknowledgment: National Highway Traffic Safety Administration
Order From: Veterans Administration Medical Center, Sampliner (RE), Chief of Gastroenterology, Tucson, Arizona, 85723

362075
THE CASE FOR MANDATORY SEAT RESTRAINT LAWS

Motor vehicle accidents are the leading cause of death and injury to children over one year of age in the United States. About 800 motor vehicle occupants less than four years old are killed each year and tens of thousands are injured severely enough to require emergency room treatment. Studies have demonstrated that the vast majority of children ride unprotected in motor vehicles. Restrained children are likely to have milder injuries or no injuries at all. One study intimates that seat belts or restraints could reduce injuries up to 70 per cent and deaths up to 90 per cent. Various educational efforts have been attempted to increase restraint and belt use. Most have not worked. Seat belt laws in other countries have been effective in increasing belt use by adults when the laws are enforced. In Tennessee, where a mandatory seat restraint law has been part of a large-scale educational effort, restraint use has increased from an average of 9 per cent prior to the law, to an average of 18.7 percent in the fall of 1979. Because the problem of motor vehicle-related deaths and injuries is widespread and because legislation holds some promise for amelioration of this problem, pediatricians and public health professionals should work toward the passage of such laws.

Paulson, JA *Clinical Pediatrics* Vol. 20 No. 4, HS-032 770, Apr. 1981, pp 285-290, 2 Tab., 22 Ref.

Acknowledgment: National Highway Traffic Safety Administration
Order From: Lippincott (JB) Company, East Washington Square, Philadelphia, Pennsylvania, 19105

362076
THE IMPACT OF MOTORCYCLE LIGHTS-ON LAW: AN UPDATE

The effect of a motorcycle lights-on law in North Carolina was examined by analyzing crash data for an eight-year period from 1971 through 1978. The law was implemented on October 1, 1973 when motorcycle activity was declining after reaching a peak during the summer months. The proportions of motorcycle crashes that were daylight multivehicle were compared with the similar proportions for all crashes. It was found that a significant decrease in these crashes occurred for motorcycles following the implementation of the law. A similar decrease was not observed for total crashes. Cost estimates for the averted injuries and deaths indicate that the lights-on legislation results in significant benefits. The results support the conclusion that the law was effective in the way that was anticipated.

Waller, PA Griffin, LI, III (Texas Transportation Institute)
North Carolina University HSRC A71, HS-032 751, May 1981, 18p, 2 Fig., 4 Tab., Refs.

Presented to the National Safety Council Symposium on Traffic Safety Effectiveness (Impact) Evaluation Projects, Chicago, Illinois.

Acknowledgment: National Highway Traffic Safety Administration
Order From: North Carolina University, Highway Safety Research Center, Chapel Hill, North Carolina, 27514

362077
USE OF THE NATIONWIDE PERSONAL TRANSPORTATION STUDY TO CALCULATE EXPOSURE

The 1977 Nationwide Personal Transportation Study can be used to calculate exposure in various--by vehicle-miles, passenger-miles, age and sex of occupants. The NPTS data were used to calculate annual passenger-miles per person by age and sex. They were also combined with data from the Fatal Accident Reporting System to calculate fatality rates per 100-million passenger-miles by age. The results rather precisely show travel risks faced by male vs. female occupants of various ages.

Carsten, O *HSRI Research Review* Vol. 11 No. 6, HS-032 750, May 1981, 8p, 2 Fig., Refs.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: Highway Safety Research Institute, Huron Parkway and Baxter Road, Ann Arbor, Michigan, 48109

362131

ROAD SAFETY INITIATIVES 1980. COMMEMORATIVE CONFERENCE, 17TH & 18TH NOVEMBER 1980, MELBOURNE, VICTORIA. PROCEEDINGS

The conference was organised by the Victorian Road Safety and Traffic Authority in association with the Herald and Weekly Times Ltd, the Royal Australasian College of Surgeons, the Royal Automobile Club of Victoria and the Victoria Police. For abstracts of individual papers presented at the conference see TRIS nos 362132-43. (TRRL)

Victoria Road Safety & Traffic Authority, Australia Monograph 1981, 583p, Figs., Tabs., Refs.

ACKNOWLEDGMENT: TRRL (IRRD 255236), Australian Road Research Board

362135

PRIORITIES FOR CRIMINOLOGICAL RESEARCH IN ROAD SAFETY

This paper highlights recent trends in criminology and assesses their relevance for road safety research. It is concluded that research priorities should be in the areas of general deterrence, physical prevention and study of the criminal justice system (especially the police). Lessons for methodology include greater use of direct and self- reported measures of behaviour rather than official statistics, experimental techniques rather than "quasi-experimental", where possible, and interrupted time series analyses of the effects of legislative changes. There is a great need for a close analysis of the way in which accident and violation data are recorded (a). The number of the covering abstract of the conference is TRIS no 362131. (TRRL)

Homel, R (MacQuarie University, Australia)
Victoria Road Safety & Traffic Authority, Australia 1981, pp 531-552, 53 Ref.

Proceedings of the Road Safety Initiatives 1980, Commemorative Conference, held November 17 and 18, 1980 at Melbourne.

ACKNOWLEDGMENT: TRRL (IRRD 255240), Australian Road Research Board

362136

ALCOHOL RELATED ACCIDENTS: CHARACTERISTICS, "CAUSES" AND COUNTER-MEASURE IMPLICATIONS

In Victoria, BAC's derived from tests taken from injured persons by hospital and coronial personnel are matched with accident data derived from police reports. The 1978 data file, comprising 6305 accidents, was analysed to determine the incidence and nature of alcohol-related accidents. One in three accidents was alcohol-related. However, most (83 per cent) alcohol-related accidents occurred at night, a finding to be expected from our knowledge of the pattern of alcohol consumption. Among night-time accidents, one in two was alcohol-related. Since traffic composition, density and speed--and hence, exposure to particular forms of risk-differ at night, inferences concerning the causal role of alcohol can only be made after controlling for exposure. The analysis was therefore restricted to night-time accidents and was conducted separately for "urban" and "rural" roads. Alcohol was over-represented, on both "urban" and "rural" roads, among single vehicle accidents, in particular among "run off road" and "struck parked vehicle" accidents. Alcohol was under-represented among multi-vehicle collisions at intersections. Among the "ran off road" accidents alcohol was significantly more prevalent in those that occurred on curved sections of road. Over three-quarters of the accidents in which a single vehicle ran off the road on a curve were alcohol-related. These accidents alone account for 22 per cent of all night-time alcohol-related accidents. The possibility of preventing such accidents through improvements to roadway delineation warrants investigation. Almost three quarters of the accidents in which a vehicle struck a fixed object, such as a utility pole or a tree, were alcohol-related. In this sense, providing a more forgiving road environment is an important alcohol countermeasure. The number of the covering abstract of the conference is TRIS no 362131. (TRRL)

Johnston, IR (Australian Road Research Board)
Victoria Road Safety & Traffic Authority, Australia 1981, pp 421-442, 7 Tab., 9 Ref.

Proceedings of the Road Safety Initiatives 1980 Commemorative Conference, held November 17 and 18, 1980 at Melbourne.

ACKNOWLEDGMENT: TRRL (IRRD 255241), Australian Road Research Board

362138

THE TRAFFIC SYSTEM AS PERCEIVED BY THE ROAD USER

The traffic system, as identified by the physical environment of roads and associated control measures together with the vehicle and its operator, reflects initiatives which have been taken for the most part in a technically professional manner. The perception of the traffic system by the road user is at times, quite different from that of the professional designer. User performance is frequently below the level expected, resulting in failure to comply with regulatory or traffic management measures which results in traffic crash losses in terms of casualty injuries and property damage. It is suggested that much greater attention should be directed to the incidence of property damage traffic crashes in view of evidence that these constitute a significant loss to the community in economic terms and are underestimated in official accident statistics. It is concluded that there is scope for improving the level of traffic safety professionalism, so that it is more cognizant of, and responsive to, the wide range of abilities within the driving population, and consequently to facilitate compliance with proven traffic safety measures. It is proposed that the initiative be taken to simplify the "legal" traffic management system by selective "deregulation" of road law and associated sanctions. It is contended that the major initiative in the 1980's will be to concentrate on the driver area and introduce a diagnostic-remedial approach to driver licensing so as to identify potential or recorded driver failures in the traffic system and to implement driver improvement programmes. The number of the covering abstract of the conference is TRIS no 362131. (TRRL)

Russell, IF McKenzie, JA (Royal Automobile Club of Victoria)
Victoria Road Safety & Traffic Authority, Australia 1981, pp 253-312, 4 Fig., 4 Tab., 43 Ref.

Proceedings of the Road Safety Initiatives 1980 Commemorative Conference, held November 17 and 18, 1980 at Melbourne.

ACKNOWLEDGMENT: TRRL (IRRD 255243), Australian Road Research Board

362139

LAW ENFORCEMENT-VICTORIAN SEAT BELT LEGISLATION-THE FIRST TEN YEARS

Ten years of enforcement of the Victorian seat belt legislation: was it mere coincidence that on the year following the introduction of this legislation, there was a sudden decline in the Victorian road casualties? Were there significant and influencing factors involved? This article does not attempt to elicit any relationship between the extent or seriousness of injuries incurred through motor vehicle crashes before or after the introduction of this legislation. Discussion is centred around the general approach to law enforcement of this legislation in particular, public reaction and observations made as a result of such enforcement measures. Equally important to the value of enforcement is the education of and selling of the value of the product to the public and to the enforcement officers, the constant education and reminders to the public through local media of the value of the product and the work of the police in carrying out their role. The law must not only be carried out, but to be more effective, it must be seen to be carried out (a). The number of the covering abstract of the conference is TRIS no 362131. (TRRL)

Shuey, KB (Victoria Police Department)
Victoria Road Safety & Traffic Authority, Australia 1981, pp 95-122, 5 Fig., 4 Tab., 4 Ref.

Proceedigs of the Road Safety Initiatives 1980 Commemorative Conference, held November 17 and 18, 1980 at Melbourne.

ACKNOWLEDGMENT: TRRL (IRRD 255244), Australian Road Research Board

362141

PATTERNS OF INJURY IN CAR OCCUPANTS

The factors responsible for the extent and nature of injuries sustained by vehicle occupants in a road crash, direction of impact, degree of intrusion and ejection, remain much the same 10 years after the introduction of compulsory seat belt legislation. Vehicle occupant restraint in any position continues to result in a significant reduction in the severity and extent of injuries, maximum benefit being obtained with head and facial injuries in frontal collisions. Unnecessary injuries due to seat belts result from incorrect fitting. Problems to be tackled in the 1980's relate to the predicted increased number of smaller cars on the road, the excessive speed of vehicles and the low level of wearing rate particularly by young children. Measures to deal with these problems involve additional legislative action, and increased occupant protection (e.g. improved belt design, protective head gear, air bags, car design) (a). The number of the covering abstract of the conference is TRIS no 362131. (TRRL)

Trinca, GW (Royal Australasian College of Surgeons)
Victoria Road Safety & Traffic Authority,Australia 1981, pp 79-94, 2 Tab., 21 Ref.

Proceedings of the Road Safety Initiatives 1980 Commemorative Conference, held November 17 and 18, 1980 at Melbourne.

Acknowledgment: TRRL (IRRD 255246), Australian Road Research Board

362145

THE ECONOMIC AND SOCIAL COSTS OF ROAD ACCIDENTS IN AUSTRALIA: WITH PRELIMINARY COST ESTIMATES FOR AUSTRALIA 1978

This report contains a review of recent accident cost estimation studies and proposes a unit cost framework which is considered appropriate from both conceptual and empirical view points for the estimation of the social costs of road accidents in Australia. A detailed set of unit and total cost estimates for Australia in 1978 is presented, based mainly on existing data sources, supplemented by accident claims data from a sample of insurance companies and the Motor Accidents Board of Victoria. These preliminary cost estimates are also classified according to injury severity. Problems associated with accident statistics and data sources are discussed together with the estimation procedures. The report concludes that social costs provide only minimum estimates of the benefits gained from accident reduction, and also that the use of average cost levels is constrained by the skewed distribution of most accident cost characteristics. Further research directed towards refinement of the conceptual and empirical bases of these estimates is recommended (A). (TRRL)

Atkins, AS (Melbourne University, Australia)
Australian Office of Road Safety Monograph CR 21, June 1981, 136p, 3 Fig., 69 Tab., Refs.

Acknowledgment: TRRL (IRRD 255208), Australian Road Research Board

362272

EMISSIONS FROM MOTOR VEHICLES

The paper reviews the current level of emissions from motor vehicles in the UK and also discusses future emission levels. Section 2 of the article examines the normal emissions from vehicles and describes which of them are generally referred to as pollutants. Section 3 briefly describes recent UK legislation on vehicle emissions while section 4 examines past trends in pollutants. A summary in section 5 details some possible future actions which can affect vehicle emissions. Possible future trends are discussed in section 6. Available evidence of the effect of vehicle pollutants on animal or plant life is briefly considered. (A) (TRRL)

Case, DJ (Alastair Dick and Associates) *Traffic Engineering and Control* Vol. 23 No. 3, HS-033 069, Mar. 1982, 6p, 2 Fig., 4 Tab., 23 Ref.

Acknowledgment: TRRL (IRRD 261548)
Order From: ESL

362365

THE CAR BOOK

This book provides consumer information on 1982 model domestic and imported cars. The first section, referred to as a "Purchasing Guide", provides an overall comparison of cars in terms of safety, fuel economy, maintenance, and insurance costs. The following chapters cover individual topics, among which are: safety with information on crash test results, child safety seats and safety belts; fuel economy; maintenance costs with information on service contracts and special tips for dealing with a mechanic; warranties; insurance costs; tires with data on fuel economy and expected mileage; a used car purchasing guide with information on safety defects and recalls for 1977-1981; and a "complaint" chapter with advice on how to resolve complaints and who to contact. A Shopping Guide or Checklist is provided for the purchaser to use when taking notes on the cars he is interested in comparing.

Gillis, J Baer, I
Tilden Press HS-032 789, 1981, 80p

Acknowledgment: National Highway Traffic Safety Administration
Order From: Tilden Press, 1737 DeSales Street, NW, Washington, D.C., 20036

362366

NATIONAL TRANSPORTATION STATISTICS. ANNUAL REPORT

This report is a summary of selected national transportation statistics from a wide variety of government and private sources. Included are cost, inventory, and performance data describing the passenger and cargo operations of the following modes: air carrier, general aviation, automobile, bus, truck, local transit, rail, water, oil pipelines, and gas pipeline. The report includes basic descriptors of U.S. transportation, such as operating revenues and expenses, number of vehicles and employees, vehicle miles and passenger miles, etc. A supplementary section includes Transportation and the Economy and Energy in Transportation. Energy in Transportation is divided into four parts: Energy Consumption, Energy Transport, Energy Intensiveness, and Energy Supply and Demand. Also included are the operating costs of automobiles of different sizes. In this edition, the selected data cover the period 1969 through 1979/1980.

Compagna, M
Transportation Systems Center, Department of Transportation, (DTS-423) DOT-TSC-RSPA-81-8, HS-032 791, Sept. 1981, 220p, Figs., Tabs., Refs., 2 App.

Acknowledgment: National Highway Traffic Safety Administration
Order From: GPO

362367

QUESTIONED HIGHWAY SAFETY PROGRAM COSTS IN MISSISSIPPI

The Department of Transportation's Office of Inspector General conducted two audits of the Mississippi State Highway Safety Grant Program at the request of the National Highway Traffic Safety Administration. GAO believes that the State's response to questions raised during the audits was, on the whole, given a fair and equitable review by the Safety Administration. However, some actions of each party to the process may have complicated and prolonged the audit resolution process.

General Accounting Office CED-81-155, HS-032 792, Sept. 1981, 14p, 2 App.

Report to the Honorable John C. Stennis, United States Senate.

Acknowledgment: National Highway Traffic Safety Administration
Order From: GAO-Document Handling & Info Services Facility, P.O. Box 6015, Gaithersburg, Maryland, 20760

362368

MICHIGAN TRANSPORTATION RESEARCH PROGRAM (MTRP) FINAL REPORT

This report describes the activities of MTRP during the past fifteen months. Studies conducted by MTRP and the nature of the MTRP organization are described.

Newland, L Zachem, H
Highway Safety Research Institute, Michigan Department of Transportation Final Rpt. UM-HSRI-81-54, HS-032 796, Oct. 1981, 46p, 3 App.

Acknowledgment: National Highway Traffic Safety Administration
Order From: Highway Safety Research Institute, Huron Parkway and Baxter Road, Ann Arbor, Michigan, 48109

362369

AUTOMOTIVE FUEL ECONOMY PROGRAM. SIXTH ANNUAL REPORT TO THE CONGRESS JANUARY 1982

This Report summarizes the activities of the National Highway Traffic Safety Administration (NHTSA) during fiscal year (FY) 1981 toward the implementation of applicable sections of Title V: "Improving Automotive Fuel Efficiency," of the Motor Vehicle Information and Cost Savings Act (15 U.S.C. 1901 et seq.) as amended (the Act). Section 502(a)(2) of the Act requires submission of a report and publication in the Federal Register (FR) by January 15 of each year. Also included is a section summarizing the use of advanced automotive technology by the industry, required by Section 305, Title III of the Department of Energy Act of 1978 (P.L. 95-238); and a section on the accomplishments of NHTSA in carrying out the Automobile Fuel Efficiency Act of 1980. This is the first time in the history of this Annual Report to the Congress that the use of advanced technology by the industry has been quantified. This topic is detailed in Section III. NHTSA's fuel economy responsibilities include: (1) establishing average fuel economy standards for manufacturers of passenger automobiles and light trucks; (2) promulgating regulations concerning procedures, definitions, and reports necessary to support those standards; (3) considering petitions for exemption from established fuel economy standards by low volume manufacturers (those producing under 10,000 vehicles annually) and establishing alternative standards for them; (4) reporting to Congress annually on the progress of the fuel economy program; (5) enforcing the fuel economy standards and regulations; and (6) responding to petitions concerning domestic production by foreign manufacturers and other matters. To date, passenger car fuel economy standards have been established by the Congress for model years (MY) 1978 through 1980 and for 1985 and thereafter and by the Department of Transportation for the 1981 through 1984 MYs. Standards for light trucks have been established by the Department of Transportation for MYs 1979 through 1985.

National Highway Traffic Safety Administration HS-806 120, 1982, 34p, Figs., Tabs.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: National Highway Traffic Safety Administration, 400 7th Street, SW, Washington, D.C., 20590

362370

EVALUATION NEWS AND NOTES

This is the second in a series of columns which provide summaries of recently completed effectiveness (impact) evaluations of traffic safety projects and programs. Notes are provided on evaluation items of particular interest to program managers and evaluators concerned with planning and conducting evaluations and implementing evaluation results. In this issue studies of motorcycle helmet usage and the impact of motorcycle helmet law repeal are summarized, and the motorcycle accident-helmet the problem is briefly reviewed.

Tarrants, WE *Traffic Safety Newsletter* HS-806 124, Jan. 1982, pp 11-14

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: National Highway Traffic Safety Administration, 400 7th Street, SW, Washington, D.C., 20590

362371

EVALUATION OF STATE MOTORCYCLE HELMET LAWS USING THE NATIONAL ELECTRONIC INJURY SURVEILLANCE SYSTEM

This article analyzes motorcyclist injury data collected by the National Electronic Injury Surveillance System (NEISS) from October 1978 through December 1980. Head injury rates were compared for NEISS-reporting States with and without a mandatory helmet use law. The States without a helmet law had significantly greater head injury rates than the States with a helmet law. In addition, the serious injury rate for the head and neck were significantly lower in the States having a helmet law as compared with States not having a helmet law. It was concluded that State motorcycle helmet laws are effective in decreasing all motorcycle head area injury rates as well as lowering most head area serious injury rates.

Berkowitz, A *Traffic Safety Newsletter* HS-806 128, Jan. 1982, pp 15-19, 6 Tab., 2 Ref.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: National Highway Traffic Safety Administration, 400 7th Street, SW, Washington, D.C., 20590

362372

STATUS OF LEGISLATION CONCERNING 911 THE EMERGENCY TELEPHONE NUMBER

This report, which sets forth the status of the state legislation for the implementation of 911, the universal emergency telephone number and suggests a 911 Emergency Telephone Number Act, is intended to assist those seeking the implementation of 911 service in their states or local governments. The text for the 911 Emergency Number Act is broadly drafted. Information on existing state 911 legislation was collected and received. A detailed analysis was performed of 911 legislation in nine states. Considerations in the implementation of 911 are discussed and it is emphasized that legislation should establish responsibility for implementing 911, identify the scope of that responsibility, and provide for both planning and funding. The importance of local participation is emphasized and the engineering and equipment problems of telephone companies must be taken into account. Implementation of 911 requires clear goals be set at the state government level. The purpose of the suggested Act is to establish 911 as the primary emergency telephone number and to develop and improve methods of handling emergency calls. It calls for 911 planning at the state and local levels, places responsibility for 911 implementation in a communications division at the state level, deals with jurisdictional problems, and addresses possible funding methods.

National Highway Traffic Safety Administration, Department of Commerce HS-804 341, July 1979, 26p

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: GPO

362373

LATEST "WORLD CAR" AIMED FOR U.S. PRODUCTION

The front-drive Renault 9 (R9) will be manufactured by American Motors at its Kenosha plant for U.S. sales starting in 1983. Most of the R9 assemblies and components are entirely new and include floorpan and body, transverse engine layout, a family of three end-on transmissions, rear suspension, and unique adjustable-tilt front seats. Permutations on the engine, transmission, and equipment options give an 11-model range. It is claimed that the car leads its class in strength, lightness (805-845 kg), noise suppression, and aerodynamics. Details of engine installation and camshaft design are briefly outlined. The automatic option was achieved with the usual torque converter and 3-speed epicyclic gearing. Front suspension is by MacPherson struts. Torsion bars are at the rear.

Scott, D, European Editor Yamaguchi, J, Asian Editor *Automotive Engineering* Vol. 89 No. 12, HS-032 801, Dec. 1981, pp 72-75, Phots.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: SAE

362374

INLET DYNAMIC PRESSURE AND VOLUMETRIC EFFICIENCY OF FOUR CYLINDER FUEL INJECTED ENGINE WITH AIR-SURGE-TANK

Volumetric efficiency and inlet pressure vibration of a four cylinder engine with air-surge-tank was investigated. It was found that the inlet pressure vibration in the induction system consists of two main waves, which can be distinguished clearly and explained by acoustic theory. One has a short period which is determined by factors of the induction system from the air purge-tank to the intake valve, the other has a relatively long period which is determined by overall design factors of the induction system. According to the numerical calculation, it was clarified that the volumetric efficiency is strongly influenced by the pressure in the short period before the intake valve closed. Therefore, how the design factors of the induction system are affecting the volumetric efficiency of the four cylinder engine with air-surge-tank can be shown by the following procedure. First, the mean pressure of two main waves in the short period before the intake valve closed are examined. It the pressure is positive value, the volumetric efficiency is improved by the wave. Second, the relation between the design factors and these waves is calculated by using acoustic theory.

Ohata, A (Toyota Motor Company Limited) Ishida, Y *JSAE Review* No. 6, HS-032 809, Nov. 1981, pp 9-17, 15 Fig.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: Society of Automotive Engineers of Japan, Inc, 10-2 Gobancho, Chiyoda-ku, Tokyo 102, Japan

362375

LEGAL SYSTEM OF JAPAN ON MOTOR VEHICLES, PART 4 TYPE APPROVAL SYSTEM OF MOTOR VEHICLES

In Japan, every motor vehicle must pass an inspection by the Ministry of Transport to ensure that they conform with the Safety Regulations for Road Vehicles before they are allowed to operate on the roads. Since detailed technical inspection on all items is impossible, a type approval system has been established in which the inspection of each type of motor vehicle is performed collectively. This system consists of the type designation system for mass-produced vehicles and the type notification system for the non-mass-produced vehicles. There is also a type approval system for devices of motor vehicles to ensure that the inspection is conducted efficiently. The type designation system ensures conformity with Safety Regulations as well as uniformity. The conduct of this system is briefly outlined. The type notification system obliges a manufacturer to notify the Minister of Transport before manufacture or sale of the new type of vehicle. Under the type approval system for motor vehicle devices, manufacturers can obtain type approval of vehicles on noise, exhaust emission control devices, and other safety devices. All motor vehicles are designated by type (construction, use, shape, etc.). This article also lists the documents and motor vehicles to be submitted at time of application, the judgement criteria of technical examination and method of testing, test items for inspection of submitted motor vehicles, the special treatment of imported motor vehicles, and test facilities.

Kume, M (Ministry of Transport, Tokyo) Omori, H Daiki, K (Road Transport Bureau) Matsumoto, K (Prime Minister's Office, Japan) *JSAE Review* No. 6, HS-032 799, Nov. 1981, pp 99-109, 4 Fig., 4 Tab.

Acknowledgment: National Highway Traffic Safety Administration
Order From: Society of Automotive Engineers of Japan, Inc, 10-2 Goban-cho, Chiyoda-ku, Tokyo 102, Japan

362376
DRUNK DRIVERS TO BE JAILED ON FIRST OFFENSE

New state bills passed by the California legislature in 1981 would make a 2-day jail sentence mandatory for a motorist's first drunk driving conviction, and would make mandatory instead of presumptive, the guilt of any motorist driving with a blood-alcohol content of more than 0.10 percent. Credit for calling attention to the need for such legislation is given to the Governor's Task Force on Alcohol, Drugs and Traffic Safety. The Task Force study also indicated that sanctions for the felony driving under the influence (DUI) causing injury should reflect the seriousness of the injuries. Recommendation was made that the Department of Motor Vehicles should be granted the authority to place restrictions on the licenses of DUI offenders who are participating in educational and rehabilitation programs and to revoke or suspend licenses of non-participants. The need for funds for aid to DUI victims is discussed and a recommendation was made for a tax on alcohol. The article also discusses the criticism by the California Supreme Court of the Legislature for passing a law in 1978 to block victims of drunk drivers from suing bars, taverns and restaurants that have contributed to the drunken state of the drivers. The Governor's Task Force also recommended an educational campaign with the following objectives: raise the priority given to the DUI problem by citizens and officials; disseminate information concerning the enforcement program; and support alcohol-traffic safety in the driver education programs in schools.

Roper, WL *California Highway Patrolman* Vol. 45 No. 9, HS-032 793, Nov. 1981, 9p

Acknowledgment: National Highway Traffic Safety Administration
Order From: California Association of Highway Patrolmen, P.O. Box 2631, Sacramento, California, 95812

362377
WINTER DRIVING TIPS

This article which provides advice for winter drivers, notes the need for snow tires and the need to check tire pressures (fluctuating temperatures alter pressure). If the state allows it, it would be advisable to use skid drains and/or studded tires. It would also be necessary that a driver be able to pull a car out of a skid and know how to brake on an icy road. Traction with small cars may be improved by the addition of a couple of hundred pound bags of sand or rock. Other winter driving tips include checking radiator hoses, heater hoses, carrying extra antifreeze, hoses, and an ice scraper. Many cities and states help improve winter conditions by salting the roads.

Nell, JJ *California Highway Patrolman* Vol. 45 No. 9, HS-032 794, Nov. 1981, 2p

Acknowledgment: National Highway Traffic Safety Administration
Order From: California Association of Highway Patrolmen, P.O. Box 2631, Sacramento, California, 95812

362378
ALTERNATIVE FUELS

The Ford Motor Company is developing vehicles which will be powered by alcohol, propane, natural gas and electricity. Propane-powered trucks are being produced and will be sold in Canada as 1982 models and later in the U.S. It is estimated that propane use could save a car owner about $350 a year based on driving 12,000 miles. Other companies also have converted cars and trucks to propane use. Last year, 28,000 trucks were altered to use propane. General Motors has done good business selling diesel engines. GM plans to offer an electric commuter car and van as early as the 1985 model year.

Janicki, E *California Highway Patrolman* Vol. 45 No. 9, HS-032 795, Nov. 1981, 3p, Phots.

Acknowledgment: National Highway Traffic Safety Administration
Order From: California Association of Highway Patrolmen, P.O. Box 2631, Sacramento, California, 95812

362379
ENGINE MATERIALS: LIGHTENING THE LOAD UNDERHOOD

The engine is becoming a prime target for weight savings and thinwall cast iron, aluminum, stamped steel and plastic are being considered for applications for everything from engine blocks to intake manifolds. AMC is using thinwall technology to lighten the block of its 4.2-L 6-cylinder engine. The intake manifold along with oil and water pumps are cast in aluminum. It is claimed that an aluminum engine block can afford the largest single gain in weight savings on a vehicle. Reynolds Metals 390 aluminum alloy technology has helped Mercedes eliminate some parts. Cadillac is also using aluminum alloy block for its 4.1-L V-8. In an effort to show that stamped steel, though not a new concept, is still viable, U.S. Steel converted the block of a 2.3-L 4-cylinder Vega engine. The engine consists of three basic stampings--the crankcase, water jacket, and engine to transmission adapter. A plastic engine that weighs less than 200 lb is being developed. No definitive description of the engine is available but it is estimated that the engine contains about 60 lb of resin reinforced with about 16 lb of carbon filler and 24 lb of glass fiber.

McCann, MK *Automotive Industries* Vol. 162 No. 1, HS-032 806, Jan. 1982, pp 49-52, Phots.

Acknowledgment: National Highway Traffic Safety Administration
Order From: Chilton Company, Chilton Way, Radnor, Pennsylvania, 19089

362380
WHY PEOPLE SING THOSE AUTO-INSURANCE BLUES

Red tape, delays, insufficient payments, arbitrary rulings and other grievances cited by auto-insurance policyholders are prompting reform laws. Examples are given of cases where auto-insurance companies have attempted to settle for less than the fair price, of unwarranted cancellation of policies, of threats to hike premiums, and of the manner of carrying out accident repairs. Many state laws have been passed in recent years. An Unfair Claims Settlement Practices Act was passed in Texas. Michigan's Essential Insurance Act is aimed at insurance companies that deny policies solely because of where one lives and regardless of one's driving record. Ohio and some 30 states have changed the rules on establishing negligence to require the insurance companies to share damages based on each driver's share of fault for the accident. Illinois requires a 20 percent discount on comprehensive auto coverage if the car owner has installed antitheft devices.

US News and World Report Vol. 41 No. 25, HS-032 808, Dec. 1981, pp 54-55

Acknowledgment: National Highway Traffic Safety Administration
Order From: US News and World Report Incorporated, 2300 N Street, NW, Washington, D.C., 20037

362381
PROTECTION FOR SCHOOL BUS OCCUPANTS. ISSUE PAPER

This Issue Paper examines the recurrent issue of whether large school buses should be required to have seat belts. It is concluded that improving the seating compartment in large school buses eliminates the need for seat belts and provides sufficient crash protection.

National Highway Traffic Safety Administration HS-806 000, Sept. 1981, 7p

Acknowledgment: National Highway Traffic Safety Administration

Order From: National Highway Traffic Safety Administration, Traffic Safety Programs, 400 7th Street, SW, Washington, D.C., 20590

362382

MOTORCYCLE OPERATOR LICENSING. ISSUE PAPER

This Issue Paper was prompted by the growth in motorcycle use and the increase in accidents, injuries and fatalities among motorcyclists. Research over the past several years has led to the development of an effective motorcycle operator licensing system capable of substantially reducing the likelihood of novice motorcyclists being involved in crashes. Efforts are now needed to obtain implementation of this improved licensing system in each State.

National Highway Traffic Safety Administration   HS-806 001, Sept. 1981, 4p

Acknowledgment: National Highway Traffic Safety Administration
Order From: National Highway Traffic Safety Administration, Traffic Safety Programs, 400 7th Street, SW, Washington, D.C., 20590

362383

BASELINE DATA FOR DESCRIBING OCCUPANT SIDE IMPACTS AND PEDESTRIAN FRONT IMPACTS IN TWO DIMENSIONS

The objective of this project has been to modify baseline data sets developed for use with the Calspan three-dimensional crash victim simulation (HSRI Version, 1981) to a form compatible with Version 4 of the MVMA two-dimensional dynamic occupant/pedestrian simulation. The report describes the baseline vehicle geometry in Part 2. The occupant and pedestrian along with their contact interactions with the vehicle are described in Parts 3 and 4. The baseline input data sets and a sampling of the resulting computer program output are given in Part 5.

Robbins, DH   Becker, JM
Highway Safety Research Institute, Motor Vehicle Manufacturers Assn of the U.S., Inc   Final Rpt.   UM-HSRI-81-29, HS-032 807, June 1981, 68p, 23 Fig., 8 Tab., 4 Ref.

Acknowledgment: National Highway Traffic Safety Administration
Order From: Highway Safety Research Institute, Huron Parkway and Baxter Road, Ann Arbor, Michigan, 48109

362384

SAFETY STANDARD BENEFIT ESTIMATES FOR LIGHT TRUCKS, VANS, AND MPVS

This document reports the results of a study in which accident data were analyzed to estimate the effects of extending FMVSS 214, FMVSS 216, FMVSS 208, FMVSS 212, and FMVSS 219 to light trucks, vans, and multi-purpose vehicles. Study objectives were to (1) estimate the magnitude of light truck, van, and MPV crash injuries in relation to those resulting from passenger car crashes; and, (2) to estimate the potential savings in the form of injury reduction that could be attributed to the extension of these standards to light trucks, vans, and MPVs. Data from the National Crash Severity Study, the National Personal Transportation Survey, the Truck Inventory and Use Survey, and an exposure dataset collected by IRPS were analyzed. FMVSS 208 showed substantial potential benefit. The benefits of extending FMVSS 212, 214, and 216 were slight, with injury prevention potential lying in the 0.2% to 0.4% range. No potential benefit to the extension of FMVSS 219 was found.

Hume, RD   Squires, ML   Romberg, RA   Uppaluri, SV
Indiana University, Bloomington, Motor Vehicle Manufacturers Assn of the U.S., Inc   Final Rpt.   19-175-40/7200, HS-032 798, Nov. 1981, 142p, Tabs., 4 App.
Contract IRPS 8106-C1198

Acknowledgment: National Highway Traffic Safety Administration
Order From: Indiana University, Bloomington, Institute for Research in Public Safety, 400 East Seventh St, Bloomington, Indiana, 47405

362385

AN EVALUATION OF AUTOMOTIVE LIGHTING SYSTEMS AND ACCIDENT INVOLVEMENT PHASE II. FINAL REPORT

Phase I survey data indicated that there was no statistically significant difference between the accident involvement of vehicles with amber rear turn signals (the "experimental" group) and those with red rear turn signals (the "control" group). However, there were some non-statistical indications that given a larger data base, some differences may be observed. Further, the data base used in the feasibility study was too small to study the turn signal separated issue. From this pilot study it was recommended that the number of claim files sampled be increased in an attempt to clarify some of the trends. On the basis of this recommendation, Transport Canada decided to proceed with Phase II of the study in the form of an expanded insurance claims files survey. The primary objective of Phase II was to determine if the accident rate for various vehicles equipped with amber turn signals was different from that for vehicles fitted with red turn signals. Possibilities for investigating various other characteristics of rear lighting systems were also considered. However, any such decisions were postponed pending the results of the expanded insurance claims survey. This report thus presents the results of this expanded survey and attempts to produce statistically valid results.

Lea (ND) and Associates Limited, Transport Canada Research and Development Centre   HS-032 790, Aug. 1979, 37p, 1 App.

Acknowledgment: National Highway Traffic Safety Administration
Order From: Lea (ND) and Associates Limited, 344 Lakeshore Road East, Oakville, Ontario, Canada

362386

AN EVALUATION OF HEAD RESTRAINTS. FEDERAL MOTOR VEHICLE SAFETY STANDARD 202

Head restraints were installed in passenger cars largely in response to Federal Motor Vehicle Safety Standard 202. The purpose of a head restraint is to prevent whiplash injury of the neck in rear impact crashes. The objectives of this Agency staff evaluation are to determine how many injuries integral and adjustable head restraints have eliminated in highway accidents, to measure the actual cost of the restraints, to assess cost effectiveness and to describe the operational performance and problems of integral and adjustable restraints. The evaluation is based on statistical analyses of three years of Texas accident data and the National Crash Severity Study, National Accident Sampling System and Fatal Accident Reporting System files; cost analyses of actual head restraint assemblies; a review of laboratory and crash tests and in-depth accident investigations; and head restraint sales data. It was found that: 75 percent of adjustable restraints are left in the down position; integral head restraints reduce the overall injury risk in rear impacts by 17 percent, adjustable restraints by 10 percent; integral restraints add $12 to the lifetime cost of owning and operating a car, adjustable restraints $40; 72 percent of the cars sold during 1960-81 had adjustable restraints, 28 percent had integral; and the existing mix of adjustable and integral restraints prevents 64,000 injuries per year.

Kahane, CJ
National Highway Traffic Safety Administration, (NPP-10)   Tech Rpt.   HS-806 108, Feb. 1982, 308p, 9 Fig., Tabs., 67 Ref., 5 App.

Acknowledgment: National Highway Traffic Safety Administration
Order From: NTIS

362387

A PUBLIC COMMUNICATIONS MANUAL FOR HIGHWAY SAFETY PLANNERS

Highway safety is a complex challenge. Many different factors lead to traffic accidents, and many approaches have been used in efforts to prevent them. Law enforcement, road design, driver training, vehicle improvements, licensing procedures, and legislation are among the countermeasures used by local traffic safety professionals. The function of this manual is to show why and how public communications can be used--not merely as another option, but also as support for other highway safety countermeasures. Planning examples are given to show how this tool can increase the success of highway safety programs in any community. Further, this manual demonstrates why highway safety managers should become knowledgeable about public communications. It points out why "PC" should be included in the initial planning phases of any highway safety program in which public awareness is an element to be considered. Of course, the underlying goal of the manual is to help reduce one of America's foremost health problems: motor vehicle crashes and their resulting casualties.

National Highway Traffic Safety Administration   HS-805 794, Apr. 1981, v.p., 3 App.

Acknowledgment: National Highway Traffic Safety Administration
Order From: National Highway Traffic Safety Administration, 400 7th Street, SW, Washington, D.C., 20590

Highway Safety Literature

362388

BICYCLING AND THE LAW

This article presents an overview of state, county and city laws related to bicycling. Bicyclists are urged to obtain copies of their particular state vehicle codes related to bicycling and to determine the local bicycle ordinances adopted by the city or county where they live or will be riding. The discussion covers the following areas: driver licensing; registration; rules of the road; motorists' duties toward cyclists; equipment requirements; accidents; and liability and insurance.

Kearney, EF
National Committee on Uniform Traf Laws & Ordinanc HS-032 802, No Date, 11p

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: National Committee on Uniform Traf Laws & Ordinanc, 801 North Glebe Road, Suite 400, Arlington, Virginia, 22203

362389

A SUMMARY OF PROGRESS TOWARD UNIFORM TRAFFIC LAWS DURING THE 1970S--WHAT NEEDS TO BE DONE IN THE 1980S

A table is presented showing how the total scores for state traffic laws based upon the degree of conformity with the Uniform Vehicle Code have changed between January 1, 1969 and December 31, 1979. The table reveals that progress toward uniformity was excellent in 5 states, good in 6 states, fair in 10 states, somewhat marginal in 8 states, and poor in 21 states. This Table and the next excludes Hawaii and includes the District of Columbia. A second table is presented showing how the number of substantial differences between state traffic laws and the Uniform Vehicle Code has changed between January 1, 1969 and December 31, 1979. This table reveals that all states reduced the number of substantial differences except for seven which showed an increase. Finally, a list is presented of the 13 states that have five or more rules which differ substantially from the Uniform Vehicle Code as of January 1, 1980 and the 17 states whose traffic laws rate less than 500 on the first table described above. A comparison here shows 11 states where any effort to improve traffic laws should be concentrated in the 1980s.

National Committee on Uniform Traf Laws & Ordinanc HS-032 803, No Date, 8p

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: National Committee on Uniform Traf Laws & Ordinanc, 801 North Glebe Road, Suite 400, Arlington, Virginia, 22203

362390

WHAT YOU MUST DO AFTER AN ACCIDENT

This article discusses the responsibilities of a driver in the event of an accident. It states that every driver involved in an accident must stop, identify himself, and aid any injured person. Failure to perform these duties carries severe legal penalties under the Uniform Vehicle Code. Under certain circumstances, a driver involved in a crash must also notify the police as soon as possible and, within five or ten days, file a written accident report. Insurance company contracts may specify additional requirements for oral or written notice of accidents.

Kearney, EF
National Committee on Uniform Traf Laws & Ordinanc HS-032 804, No Date, 7p

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: National Committee on Uniform Traf Laws & Ordinanc, 801 North Glebe Road, Suite 400, Arlington, Virginia, 22203

362391

MODEL MOPED LEGISLATION

This Model Law dealing with mopeds, although not part of the Uniform Vehicle Code, relies on that document and even duplicates some of its sections. Parts of this Model Law present drafts of legislation that could be adopted as laws. Other parts of this Model Law indicate that a few states need to amend laws without presenting drafts of legislation. Some parts of this Model Law are addressed to the executive branch of government in some states and to legislatures in others. The following areas are covered: definition of mopeds; registration; driver licensing; insurance; dealers; equipment; inspection; sidewalks; bike trails; bicycle only lanes; helmets and eye protection; position on roadway; bicycle left turn; parking; altering of mopeds; manner of riding; controlled-access highways; and manual for moped drivers.

National Committee on Uniform Traf Laws & Ordinanc HS-032 805, No Date, 16p

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: National Committee on Uniform Traf Laws & Ordinanc, 801 North Glebe Road, Suite 400, Arlington, Virginia, 22203

362392

METHANOL CAN BE CONVERTED TO GASOLINE

This article describes a methanol-to-gasoline (MTG) process for conversion of solid and gaseous fuels to liquid gasoline which can be used without requiring vehicle modification. The key to the MTG process is a novel shape-selective zeolite (ZSM-5 class) catalyst. MTG gasoline properties compare favorably with those of conventional petroleum-derived gasolines, the primary difference being the presence of a two percent weight concentration of durene in the MTG product. Conventional gasolines in the U.S. contain about 0.2-0.5 percent weight durene. However no adverse effect of the two percent durene was noted in any of the vehicles or laboratory simulations of distribution/handling exposures.

Automotive Engineering Vol. 89 No. 12, HS-032 800, Dec. 1981, pp 57-59, 1 Fig., 1 Tab. Based on SAE paper 811403, "Methanol-to-Gasoline, An Alternative Route to High Quality Gasoline," by F.B. Fitch and W. Lee.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: SAE

362393

SUPPORT FOR HIGHWAY SAFETY PROGRAMS

The National Highway Safety Advisory Committee formed a Task Force on Support for Highway Safety Programs. The Task Force held a series of public meetings in Washington, D.C., on February 3 and 4, 1981, to address the question of how the U.S. Department of Transportation might work more effectively with the participants' organizations to achieve goals of mutual interest. This report represents the summation of what transpired during those public meetings. The following three major areas emerged as central concerns: (1) The importance of recognizing motor vehicle injuries as a major public health issue that needs to be addressed in a manner commensurate with other major health issues confronting our society; (2) The need for recognition of the enormous economic costs associated with motor vehicle injuries and how these costs translate into higher State and local budgets, higher costs for business and industry, and higher family expenses; and (3) The importance of better communication and public relations between DOT/NHTSA and organizations, agencies, and groups (both government and private) that are involved in highway safety-related activities. These three areas are discussed in more detail in this report.

National Highway Safety Advisory Committee, NHTSA HS-806 053, June 1981, 12p

A Report to the Secretary of Transportation.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: National Highway Safety Advisory Committee, NHTSA, 400 7th Street, SW, Washington, D.C., 20591

362394

NATIONAL PROJECT REPORTING SYSTEM ANNUAL REPORT FY 1981

The Fiscal Year 1981 NPRS report contains project level data from October 1, 1980 to November 30, 1981. This report includes NHTSA (FHWA not included) 402 funded highway safety projects placed under agreement during FY 1981 regardless of the year of obligation. In addition, some comparative data are presented for FY 1979, FY 1980 and FY 1981. This is the first NPRS annual report designed for the use of both headquarters and regional office program managers. Some past summaries have been eliminated and others added based on suggestions from NPRS users. Data are uniformly displayed at the national, regional and State levels and broken down by Problem and Standard Areas. For example, percentage comparisons can be made of funds under agreement for alcohol projects at the national and State levels. No attempt has been made to analyze or interpret the data. The data base includes 50 States plus Puerto Rico, District of Columbia, Virgin Islands, Guam, American Samoa and Northern Marianas, a total of 56 jurisdictions.

National Highway Traffic Safety Administration HS-806 109, Jan. 1982, 68p

Any of the data elements found in these reports as well as any other information stored in this system are available via the Regional Office and Headquarters data terminal.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: National Highway Traffic Safety Administration, 400 7th Street, SW, Washington, D.C., 20590

362395

ALCOHOL DRUGS AND TRAFFIC SAFETY VOLUME I

These proceedings present a review of current knowledge, an assessment of the state of the art, and a discussion of new findings in the area of alcohol, drugs and traffic safety. The contributions to these proceedings cover a wide field ranging from epidemiology, biochemistry, pharmacology, physiology, prevention and rehabilitation, to economy and insurance, pratical police work and problems specific to underdeveloped countries. The proceedings are divided into three Volumes. This Volume, Volume I, contains the opening remarks of the Inaugural Session and the papers presented in Section 1, the epidemiology of alcohol and drugs related to traffic. Volume I also contains the proceedings of a Seminar on Alcohol, Drugs and Traffic Safety in Developing Countries which was held as an integral part of the conference. A list of films shown during the conference concludes Volume I.

Goldberg, L, Editor (Karolinska Institute, Sweden)
Almqvist and Wiksell International   HS-032 818, 1981, 427p, Figs., Tabs., Refs.

Proceedings, 8th International Conference on Alcohol, Drugs and Traffic Safety, June 15-19, 1980, Stockholm, Sweden.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: Almqvist and Wiksell International, Gamla Brogatan 15-17, P.O. Box 62, S-101 20 Stockholm, Sweden

362396

ALCOHOL DRUGS AND TRAFFIC SAFETY VOLUME II

These proceedings present a review of current knowledge, an assessment of the state of the art, and a discussion of new findings in the area of alcohol, drugs and traffic safety. The contributions to these proceedings cover a wide field ranging from epidemiology, biochemistry, pharmacology, physiology, prevention and rehabilitation, to economy and insurance, practical police work and problems specific to underdeveloped countries. The proceedings are divided into three Volumes. This Volume, Volume II, contains the papers from Section 2, Analytical Aspects, and the proceedings of the Police Seminar which was held as an integral part of the conference.

Goldberg, L, Editor (Karolinska Institute, Sweden)
Almqvist and Wiksell International   HS-032 819, 1981, pp 433-876, Figs., Tabs., Phots., Refs.

Proceedings, 8th International Conference on Alcohol, Drugs and Traffic Safety, June 15-19, 1980, Stockholm, Sweden.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: Almqvist and Wiksell International, Gamla Brogatan 15-17, P.O. Box 62, S-101 20 Stockholm, Sweden

362397

ALCOHOL DRUGS AND TRAFFIC SAFETY VOLUME III

These proceedings present a review of current knowledge, an assessment of the state of the art, and a discussion of new findings in the area of alcohol, drugs and traffic safety. The contributions to these proceedings cover a wide field ranging from epidemiology, biochemistry, pharmacology, physiology, prevention and rehabilitation, to economy and insurance, practical police work and problems specific to underdeveloped countries. The proceedings are divided into three Volumes. This Volume, Volume III, contains the papers from Section 3, Pharmacological, physiological and psychological aspects relevant to driving impairment and Section 4, Control, prevention, education, rehabilitation, information and insurance, and the summaries and closing remarks of the Closing Session.

Goldberg, L, Editor (Karolinska Institute, Sweden)
Almqvist and Wiksell International   HS-032 820, 1981, pp881-1489, Figs., Tabs., Refs.

Proceedings, 8th International Conference on Alcohol, Drugs and Traffic Safety, June 15-19, 1980, Stockholm, Sweden.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: Almqvist and Wiksell International, Gamla Brogatan 15-17, P.O. Box 62, S-101 20 Stockholm, Sweden

362398

DRIVING FOR THE DISABLED

This article discusses adaptations available for modifying vehicles for disabled drivers. It also briefly discusses other needs of disabled drivers such as special parking facilities and insurance at reasonable cost. Mention is made of the planned production of specialized vehicles which will provide personal independent mobility to disabled people unable to transfer themselves from wheelchair to car as they may remain in their own wheelchair while driving. Since this article is addressed to medical practitioners that they may be aware of how easy it is for the disabled to drive a suitably adopted vehicle, it concludes by stating that, "A doctor will have done enough even if he just raises the question of driving and refers his patient to a motoring club for the disabled."

Tachakra, SS (Central Middlesex Hospital) *British Medical Journal* Vol. 283 HS-032 821, Aug. 1981, pp 589-591, 2 Fig.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: British Medical Association, BHA House, Tavistock Square, London WC1 H9JR, England

362399

WAX-TYPE ADDITIVE EXTENDS TIRE LIFE

This article states that hydrocarbon wax-type additives inhibit tire damage from atmospheric ozone. The additives keep the exposed areas (the tread and sidewalls) from cracking, thus maintaining tire serviceability and appearance. A discussion is then presented of the outward migration of the wax additives.

Torres, J (General Tire and Rubber Company) *Rubber World* Vol. 184 No. 6, HS-032 823, Sept. 1981, 2p

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: Bill Communications, Incorporated, 633 Third Avenue, New York, New York, 10017

362400

13 HIGH PERFORMANCE TIRES

This article reports the results of performance tests on 60-series radial tires. Thirteen different tires manufactured in five different countries were tested. There were two sizes in the test, 205/60HR-13 and 185/60HR-14. The car used was the Volkswagen Scirocco. A complete description of how the tires were tested is provided along with charts showing test results and a separate discussion of test results for each tire.

Simanaitis, D, Engineering Editor *Road and Track* Vol. 33 No. 6, HS-032 825, Feb. 1982, p 69, Phots.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: CBS Consumer Publishing West, 1499 Monrovia Avenue, Newport Beach, California, 92663

362401

ROLLOVER ACCIDENTS--JEEP CJ-5

Stating that utility vehicles have the highest rate of involvement in single vehicle rollover crashes, this article addresses specifically the American Motors Corporatin Jeep CJ-5. A review of 1980 tests by the Insurance Institute for Highway Safety and 1981 tests by the Highway Safety Research Center at the University of North Carolina shows that the Jeep CJ-5 has a poor performance record. Also the Jeep CJ-5 had the worst report of personal injury claim frequency results for 1977 through 1980 model utility vehicles according to the Highway Loss Data Institute. Since knowledge of the vehicle and what it can and cannot do is essential, the last half of this article is devoted to tips for on-road driving and off-road operation of utility vehicles. These tips were provided by American Motors Corporation with the Jeep CJ-5 specifically in mind.

Driver Vol. 15 No. 7, HS-032 831, Dec. 1981, pp 14-19, Phots.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: GPO

362402

DESIGN OF MIRROR SYSTEMS FOR COMMERCIAL VEHICLES

This article describes a computer aided design project for the evaluation of alternative rear-view mirror systems for a range of commerical vehicles. The design of rear-veiw mirror systems for buses is also discussed. Ergonomic as well as legislative criteria were the basis for the evaluation.

Case, K (Nottingham University, England) Bonney, MC (Verlag Karl Thiemig) Port, JM (Loughborough University of Technology, England) Levis, J (Human Factors, Leyland Vehicles) *Automotive Engineer* Vol. 6 No. 6, HS-032 835, Dec. 1981, pp 15-17, 9 Fig.

Acknowledgment: National Highway Traffic Safety Administration
Order From: Mechanical Engineering Publications Limited, Box 24, Northgate Avenue, Bury St. Edmunds, Suffolk 1P32 6PW, England

362403

COPPER IN THE AUTOMOTIVE INDUSTRY

This article reviews the use of copper and copper alloys in motor vehicles. Specific applications discussed include bearings and bushing alloys and radiators. New fabrication techniques in the field of soldered copper/brass radiators are discussed. The article is supplemented with examples of copper use by the Swedish Granges Group and SU Butec's Llanelli Radiators.

Harris, WJ (Talbot Motor Company) *Automotive Engineer* Vol. 6 No. 6, HS-032 836, Dec. 1981, pp 22-23, 1 Fig., 1 Tab.

Acknowledgment: National Highway Traffic Safety Administration
Order From: Mechanical Engineering Publications Limited, Box 24, Northgate Avenue, Bury St. Edmunds, Suffolk 1P32 6PW, England

362404

A COMPUTER PROGRAM (VEHSIM) FOR VEHICLE FUEL ECONOMY AND PERFORMANCE SIMULATION (AUTOMOBILES AND LIGHT TRUCKS) VOLUME I: DESCRIPTION AND ANALYSIS

This report presents an updated description of a vehicle simulation program, VEHSIM, which can determine the fuel economy and performance of a specified vehicle over a defined route as it executes a given driving schedule. Vehicle input accommodated by VEHSIM include accessories, engine, rear axle, converter, transmission, tires, aerodynamic drag coefficient, and shift logic. The report is comprised of four volumes. Volume I presents a description of the numerical approach and equations.

Zub, RW
Transportation Systems Center, National Highway Traffic Safety Administration, (DTS-323) Final Rpt. DOTTSC-NHTSA-81-23.I, HS-806 037, Oct. 1981, 104p, 11 Fig., 3 Tab., 2 App.

Acknowledgment: National Highway Traffic Safety Administration
Order From: NTIS

362405

A COMPUTER PROGRAM (VEHSIM) FOR VEHICLE FUEL ECONOMY AND PERFORMANCE SIMULATION (AUTOMOBILES AND LIGHT TRUCKS) VOLUME II: USERS GUIDE

This report presents an updated description of a vehicle simulation program, VEHSIM, which can determine the fuel economy and performance of a specified vehicle over a defined route as it executes a given driving schedule. Vehicle input accommodated by VEHSIM include accessories, engine, rear axle, converter transmission, tires, aerodynamic drag coefficient, and shift logic. The report is comprised of four volumes. Volume II is a user's manual.

Zub, RW
Transportation Systems Center, National Highway Traffic Safety Administration, (DTS-323) Final Rpt. DOTTSCNHTSA-81-23 II, HS-806 038, Oct. 1981, 162p, 15 Fig., 6 Tab.

Acknowledgment: National Highway Traffic Safety Administration
Order From: NTIS

362406

A COMPUTER PROGRAM (VEHSIM) FOR VEHICLE FUEL ECONOMY AND PERFORMANCE SIMULATION (AUTOMOBILES AND LIGHT TRUCKS) VOLUME III: GLOSSARY AND LISTINGS

This report presents an updated description of a vehicle simulation program, VEHSIM, which can determine the fuel economy and performance of a specified vehicle over a defined route as it executes a given driving schedule. Vehicle input accommodated by VEHSIM include accessories, engine, rear axle, converter transmission, tires, aerodynamic drag coefficient, and shift logic. The report is comprised of four volumes. Volume III contains the program listings.

Zub, RW
Transportation Systems Center, National Highway Traffic Safety Administration, (DTS-323) Final Rpt. DOTTSCNHTSA-81-23III, HS-806 039, Oct. 1981, 332p

Acknowledgment: National Highway Traffic Safety Administration
Order From: NTIS

362407

A COMPUTER PROGRAM (VEHSIM) FOR VEHICLE FUEL ECONOMY AND PERFORMANCE SIMULATION (AUTOMOBILES AND LIGHT TRUCKS) VOLUME IV: ENHANCEMENTS

This report presents an updated description of a vehicle simulation program, VEHSIM, which can determine the fuel economy and performance of a specified vehicle over a defined route as it executes a given driving schedule. Vehicle input accommodated by VEHSIM include accessories, engine, rear axle, converter transmission, tires, aerodynamic drag coefficient, and shift logic. The report is comprised of four volumes. Volume IV describes a simulation of the Integrated Overdrive Transmission with a split-torque converter.

Zub, RW
Transportation Systems Center, National Highway Traffic Safety Administration, (DTS-323) Final Rpt. DOTTSCNHTSA-81-23 IV, HS-806 040, Oct. 1981, 50p, 8 Fig., 5 Tab., 2 App.

Acknowledgment: National Highway Traffic Safety Administration
Order From: NTIS

362408

REGULATORY REFORM--THE REVIEW PROCESS

This report describes that portion of the review process (not the Regulatory Impact Analysis process) used by the National Highway Traffic Safety Administration to determine the effectiveness, benefits and costs of existing regulations so as to trigger the actions necessary to modify, rescind or retain them. The report is divided into five parts. Part I covers the description and "rules" of the review process both from a current and historical perspective, and what the process yields. Discussions of results and subsequent actions for each completed evaluation are presented in Part II. Since there is considerable interest in reducing the administrative burden of regulations, this subject is addressed in Part III. Part IV deals with evaluations underway, including the contractual work, data sources and expected schedules for completing reviews. Part V lays out a preliminary regulatory review plan with a proposed schedule and priorities for regulations to be reviewed and a request for comments.

National Highway Traffic Safety Administration HS-806 159, Mar. 1982, 101p

Acknowledgment: National Highway Traffic Safety Administration
Order From: National Highway Traffic Safety Administration, 400 7th Street, SW, Washington, D.C., 20590

362409

EVALUATION OF HYDRAULIC BRAKE SYSTEM TESTS OF USED 1973 AND 1978 VEHICLES. STANDARD 105-75--HYDRAULIC BRAKE SYSTEMS, PASSENGER CARS

This is the first in a series of evaluative analyses on vehicle braking systems as they relate to the requirements of Federal Motor Vehicle Safety Standard (FMVSS) 105, Hydraulic Brake Systems. It deals with the effect of aging on braking performance and that of brake maintenance. The study looks only at the standard for passenger cars and focuses on the current version of the standard, FMVSS 105-75. The primary purpose of this study was to compare post-standard vehicles' performance on the compliance test with that of used pre-standard vehicles. In order to make these comparisons between pre-and post-105-75 cars, five 1973 (pre-standard) and five 1978 (post-standard) vehicles were chosen for study. Each of the ten vehicles was subjected to the FMVSS 105-75 compliance test "as is" and with original equipment equivalent replacement linings. Additionally, the 1978 cars were retested with an aftermarket lining. The tests were run to determine the best stopping distances obtainable. The results indicate that used post-105-75 cars perform better than used pre-105-75 vehicles on the standard's compliance test. More importantly, the 1978's performed better than the 1973's in terms of stopping distance both when the vehicles were tested "as is" and when they were tested with replacement linings. Replacing the linings on used vehicles improved their stopping distance performance, but the improvement was not as pronounced for the 1973's as it was for the

1978's. Original equipment linings and one aftermarket lining tested were found to be equally successful in improving the stopping distance performance of used post-standard cars.

Ichter, KD
National Highway Traffic Safety Administration, (NPP-10) Tech Rpt. HS-806 164, Mar. 1982, 68p, Tabs., 5 App.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: NTIS PB82-214677

362410

PRELIMINARY REPORT--THE COST OF AUTOMOBILE SAFETY REGULATIONS

When an automobile manufacturer initiates changes that improve the safety of a vehicle, it will usually incur higher production costs for that vehicle. These increased costs reflect the additional labor, materials, investment, design and testing that are necessary to comply with federal standards. To offset these costs, manufacturers tend to raise the price of the vehicle to consumers. These costs, which in this paper will be referred to as direct manufacturing costs, are the most visible, and usually the most significant costs associated with federal safety standards. This report addresses the extent of these costs and the nature of the burden they impose on automobile manufacturers. Other more indirect effects, such as changes in fuel economy and vehicle sales, are also addressed. Six components of the direct costs of NHTSA's automobile regulations identified and discussed are: (1) Variable Costs; (2) Capital Costs; (3) Research and Development Costs (4) Engineering and Launch Costs; (5) Compliance Testing Costs; and (6) Administrative Costs. In addition, the effects of these costs on consumer prices and the relative significance of these costs compared to other sources of automobile price increases are discussed.

National Highway Traffic Safety Administration HS-806 166, Mar. 1982, 46p, 10 Tab.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: National Highway Traffic Safety Administration, Office of Program and Rulemaking Analysis, Washington, D.C., 20590

362411

IMPACT ANALYSIS OF THE RAISED LEGAL DRINKING AGE IN ILLINOIS

Illinois raised its minimum legal drinking age in January 1980 from age 19 to 21 years. As a result, drivers age 19 and 20 who could previously purchase alcohol can no longer do so. This analysis attempts to determine what reduction, if any, in alcohol involvement in accidents can be attributed to the law change in Illinois.

Maxwell, DM
National Highway Traffic Safety Administration Tech Rpt. HS-806 168, Dec. 1981, 10p, 9 Fig., 5 Tab., 11 Ref., 1 App.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: National Highway Traffic Safety Administration, 400 7th Street, SW, Washington, D.C., 20590

362412

AUTOMOTIVE TECHNOLOGY--ON THE MOVE

The Twentieth Century is the century of the motor vehicle. In the course of one long lifetime, these vehicles have irreversibly changed the world's way of life. And in the course of one short decade--the 1970's--events have irreversibly changed these vehicles. This article discusses the events impinging on the auto industry in the '70s, and foreseen for the '80s and '90s, and the technological responses to them.

Caplan, JD Hildenbrand, BA *Transportation Quarterly* Vol. 36 No. 1, HS-032 822, Jan. 1982, pp 5-19, 4 Fig., 2 Tab.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: Eno Foundation for Transportation, Incorporated, P.O. Box 55, Saugatuck Station, Westport, Connecticut, 06880

362413

CAR SIZE, DEATHS LINKED; SMALL IMPORTS FOUND WORST--A SPECIAL ISSUE

The number of subcompacts and small subcompacts on the road has increased dramatically in the last few years, and is likely to increase further. With fuel prices high and automobile efficiency at a premium, there is little reason to think Americans will reverse their trend toward buying small, light vehicles instead of larger, safer ones. This special issue of Status Report focuses on the high numbers of deaths in small cars, and it examines the vital need for implementing already available technologies to reduce the number of people who are killed and injured every day in crashes of their subcompacts and small subcompacts.

Status Report Vol. 17 No. 1, HS-032 826, Jan. 1982, 11p, 9 Fig., 1 Phot.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: Insurance Institute for Highway Safety, Watergate 600, Washington, D.C., 20037

362414

PEAK AND SUSTAINED ISOMETRIC FORCES APPLIED TO A TRUCK STEERING WHEEL

Each of 269 truck and bus drivers applied peak and sustained isometric forces to a truck steering wheel using three different hand positions. Subjects were instructed to maintain force for 15 s. Mean peak torque was 147 Newton-meters (Nm). The peak torque decayed 12% in the first 5 s, 17% after 10 s, and 21% after 15 s. The torque values were compared to steering wheel torques produced during a front tire blowout in a large truck. Depending on the hand position and time relationship between the peak torque produced from the blowout and the drivers' peak torque, 7 to 16% of the drivers might have lost control of the truck. The time-averaged blowout torques could probably be controlled by all subjects even 15 s after they produced their peak torque.

Sanders, MS *Human Factors* Vol. 23 No. 6, HS-032 829, Dec. 1981, pp 655-660, 2 Tab., Refs.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: Canyon Research Group, Incorporated, Sanders (Mark S), 741 Lakefield Road, Suite B, Westlake Village, California, 91361

362415

PREDICTING DRIVER SEEING DISTANCE IN NATURAL RAINFALL

Four field studies were conducted in natural rainfall to develop a model for predicting distances at which drivers are able to see other vehicles in the roadway at various time periods following stoppage of a windshield-wiper stroke. The seeing distance prediction was developed as a function of rain intensity, rain accumulation time, and ambient daylight illumination. Two situations were studied; in the first, drivers seated in a stationary vehicle detected moving vehicles, and in the second, moving drivers detected a stationary vehicle. Useful seeing distance models were developed from field studies. Seeing distances predicted from the models developed from these earlier studies were compared with seeing distances obtained in a subsequent validation field test. Results indicated that average error in the prediction of seeing distances ranges from 9% to 23%.

Bhise, VD Meldrum, JF Forbes, LM (Ford Motor Company) Rockwell, TH (Ohio State University) McDowell, ED (Oregon State University) *Human Factors* Vol. 23 No. 6, HS-032 827, Dec. 1981, pp 667-682, 6 Fig., 3 Tab., Refs.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: Ford Motor Company, Dr Bhise (Vivek D), P.O. Box 2053, Dearborn, Michigan, 48121

362416

DRIVER/VEHICLE STEERING RESPONSE LATENCIES

A steering maneuver was induced among unalerted drivers by the sudden opening of the door of a car parked near the path of travel. Lateral displacement of 1326 cars was measured unobtrusively. When plotted as a function of the time available for it, the averaged lateral displacement started at a latency of about 1.5 s, reached its halfway point at 2.5 s and its maximum at somewhat less than 4 s. This steering-response function was similar whether measured close to the parked car or 15 m in front of it, and it was independent of the cars' prior speed or lateral position. On the basis of these and consistent earlier results from related experiments, it was recommended that, for safe operation, at least 3 s should be reserved for drivers to respond, by steering, to changes in the road environment.

Summala, H *Human Factors* Vol. 23 No. 6, HS-032 828, Dec. 1981, pp 683-692, 5 Fig., Refs.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: Helsinki University, Finland, Summala (Heikki), Dept Gen Psych, Ritarikatu 5, SF-00170 Helsinki 17, Finland

362417

DRINKING, DRIVING, AND THE LAW

This is a review of and commentary on literature published over a five-year period from July 1974 to 1979 that pertains to legal aspects of drunken driving and alcohol involvement in highway crashes. Although the author sought to identify every article and book published in English, the review does not purport to be exhaustive. Some materials were unavailable and others were not worthy of comment. In addition, some writings are treated much more extensively than others, indicating primarily the reviewer's evaluation of the relative importance, novelty, or interest of the pieces. To provide continuity and context, the writings have been classified as follows: (1) Legal Issues under Chemical Test and Implied Consent Laws; (2) Descriptive Studies about Anti-Drunken Driving Laws and Programs; (3) Criminal and Civil Legal Consequences of Automobile Crashes Caused by Drunken Driving; and (4) The Effect of Anti-Drunken Driving Laws on Driver Behavior. In some instances reference is made between categories.

Little, JW (Florida University, Gainesville) *Criminal Justice Abstracts* Vol. 12 No. 2, HS-032 840, June 1980, pp 261-289

Acknowledgment: National Highway Traffic Safety Administration
Order From: National Council on Crime and Delinquency, 411 Hackensack Avenue, Hackensack, New Jersey, 07601

362418

MTMC PAMPHLET 55-16 VOLUME III--MASTERING TRAFFIC ENGINEERING

MTMC Pamphlet 55-16 presents economical ways to increase roadway capacity and reduce traffic demand through transportation system management (TSM) and basic traffic engineering actions. MTMC Pamphlet 55-16 is divided into three volumes: I-MASTERing Alternative Work Schedules, II-MASTERing Ridesharing, and III-MASTERing Traffic Engineering. To meet the pressing need for ridesharing guidance, Volume II, dated October 1980, was published ahead of the other two volumes. Volume I, which presents work schedules as a means of facilitating ridesharing and reducing traffic congestion, was published in January 1981. Volume III, this volume, has two sections. Section 1 presents ways to clear up common traffic bottlenecks that result in wasted gasoline. Section 2 assists in the planning and design of facilities that will encourage motorists to switch to a more energy-efficient travel mode--the bicycle.

Military Traffic Management Command HS-032 839, Aug. 1981, 64p, Refs.

Acknowledgment: National Highway Traffic Safety Administration
Order From: GPO

362419

DYNAMOMETERS

Modern chassis dynamometers can be used to simulate any normal highway operating condition and for the analysis of brake, fuel and ignition systems. This article presents schematic diagrams and briefly outlines the way in which the dynamometer could be used.

Carrier, H *Brake and Front End* HS-032 834, Dec. 1981, 6p, 4 Fig.

Acknowledgment: National Highway Traffic Safety Administration
Order From: Babcox Publications, Incorporated, 11 South Forge Street, Akron, Ohio, 44304

362420

RULES OF THE ROAD, REVISED DECEMBER 1978

This guidebook is designed to assist foreign residents and visitors to drive and get about Japan safely and confidently. The book consists of ten chapters which cover the following areas: general rules for everybody; rules for the pedestrian; rules for the bicyclist; points to be checked before getting behind wheel; driving tips; danger spots and hazardous conditions; tips on driving national expressways and motorways; motorcycling; advice on traffic accidents and breakdowns; and duties of car owners and driving supervisors. Tables are presented which explain police officer and traffic warden signals, signboards, traffic signs, and pavement markings. vehicles be towed from the scene. The combined

Highway Safety Research Institute, National Highway Traffic Safety Administration UM-HSRI-80-37, HS-805 530, June 1980, 110p, Figs., Tabs., Phots., 1 App.
See also HS-805 531.

Acknowledgment: National Highway Traffic Safety Administration
Order From: International Association of Traffic & Safety Sci, 6-20, 2-chome, Yaesu, Chuo-ku, Tokyo 104, Japan

362421

INSPECT YOUR CAR

This article, which warns against the use of unsafe and defective vehicles, lists some common car problems and their warning signals. Daily and weekly checks are indicated for turn signals, loose wire connections, tire wear, tire pressure, shock absorbers, and engine problems. A monthly 15-mile run at about 45 to 50 mph is indicated for a hot engine check. Other monthly checks include those for misfire, accurate steering, brake squeal, and worn piston rings.

Joseph, A *California Highway Patrolman* Vol. 45 No. 10, HS-032 833, Dec. 1981, pp 30-31, Phots.

Acknowledgment: National Highway Traffic Safety Administration
Order From: California Association of Highway Patrolmen, P.O. Box 2631, Sacramento, California, 95812

362422

GEOMETRIC ANALYSIS OF THE VARIABLE RATIO STEERING GEAR

The geometric relationships between the rack and pinion (sector) gears which compose a variable ratio steering gear and a universal method for analyzing these gear teeth surfaces were investigated. The proposed analytical method was applied to an investigation of a ball and screw type steering system. Various geometric characteristics of the sector tooth surface generated by the plane rack tooth surface were studied. Tooth design characteristics such as undercut limit and tooth profile interference were obtained.

Yanai, T Hitomi, N Higuchi, M (Nissan Motor Company, Limited) *JSAE Review* No. 6, HS-032 812, Nov. 1981, pp 35-40, 12 Fig., 4 Ref.

Acknowledgment: National Highway Traffic Safety Administration
Ordef From: Society of Automotive Engineers of Japan, Inc, 10-2 Goban-cho, Chiyoda-ku, Tokyo 102, Japan

362423

DESIGN CONCEPT OF FRONT SUSPENSION COMPLIANCE APPLICATION TO THE BLUEBIRD 910 WITH EXAMINATION OF STEERING SHIMMY

It is known that the concept of suspension compliance is one of the important parameters in achieving better handling performance and improved riding comfort. Theoretical and experimental analyses were carried out on the influence of the front suspension compliance on steering shimmy and riding comfort. The results of the study were applied to the front suspension design of the Bluebird 910.

Inaba, A Miyajima, M (Nissan Motor Company, Limited) *JSAE Review* No. 6, HS-032 813, Nov. 1981, pp 43-49, 15 Fig., 4 Ref.

Acknowledgment: National Highway Traffic Safety Administration
Order From: Society of Automotive Engineers of Japan, Inc, 10-2 Goban-cho, Chiyoda-ku, Tokyo 102, Japan

362424

IMPROVEMENT OF PROCESS PLANNING IN AUTO-BODY PRODUCTION

This paper describes an improved method of preparing for auto-body production. It discusses the methods which can be introduced to achieve higher targets, improve efficiency and maintain quality standards. Although, there are three major factors which comprise the target i.e., Quality, Cost and Quantity, only Quality governs the target basically. The author discusses first the method of "Quality Evolution" which has recently been developed and used to achieve quality targets, then the method of "Four Stages" which is applied to introduce automation for cost reduction.

Takezawa, N (Toyota Auto Body Company, Limited) *JSAE Review* No. 6, HS-032 814, Nov. 1981, pp 51-60, 12 Fig., 5 Ref.

Acknowledgment: National Highway Traffic Safety Administration
Order From: Society of Automotive Engineers of Japan, Inc, 10-2 Goban-cho, Chiyoda-ku, Tokyo 102, Japan

Highway Safety Literature

362425

NEW WASHING SYSTEM IN CONTINUOUS GAS CARBURIZING LINES

New pollution-free, energy-saving cleaning systems have been developed for use in continuous gas carburizing lines. Details of such systems are outlined in this article and some of their practical applications are described.

Nojiri, S Yokotsuka, M (Isuzu Motors Limited) *JSAE Review* No. 6, HS-032 815, Nov. 1981, pp 63-68, 6 Fig., 2 Phot.

Acknowledgment: National Highway Traffic Safety Administration
Order From: Society of Automotive Engineers of Japan, Inc. 10-2 Goban-cho, Chiyoda-ku, Tokyo 102, Japan

362426

SINTERED ALLOY MATERIALS FOR VALVE SEATS

Sintered materials for automotive valve seats have recently come to be used also for diesel engines. The sintered materials now in use for valve seats were classified into several categories, and some examples of applications of composite valve seats using sintered materials that are expected to further increase in the future from the standpoint of energy saving are introduced. In addition, the views on troubles peculiar to valve seats when leaded gasoline is used as well as on the countermeasures for preventing them are presented.

Takahashi, K (Nippon Piston Ring Company, Limited) Hiraoka, T Urano, S *JSAE Review* No. 6, HS-032 816, Nov. 1981, pp 83-89, 17 Fig., 5 Tab.

Acknowledgment: National Highway Traffic Safety Administration
Order From: Society of Automotive Engineers of Japan, Inc, 10-2 Goban-cho, Chiyoda-ku, Tokyo 102, Japan

362427

APPLICATION OF POTASSIUM HEXATITANATE FIBERS TO AUTOMOTIVE MATERIALS

Potassium hexatitanate (K2Ti6O13) fibers are fabricated by the flux and melt methods. The crystal structure of this fiber is characterized by a tunnel structure consisting of the chains sharing the edges and corners of TiO6 octahedra along the b-axis. The K2Ti6O13 fibers have high chemical stability and water resistance. Mechanical strength such as the bending strength, Young's modulus and thermal expansion coefficient, and thermal conductivity of the sintered potassium hexatitanates were measured. The thermal conductivity at high temperatures indicated this material was superior as a heat insulator. The improvements of the automotive brake lining material have been achieved through the replacement of asbestos by potassium titanate fibers. According to a NASA-report, the best low-cost composite formulation exhibits an essentially constant coefficient of friction with temperature to 650 deg F, and the average coefficient is approximately 0.34. The wear is equal to the standard at low temperature and 46 percent better between 400 and 650 deg F. The acoustic absorptivity of K2Ti6O13 fibers was roughly measured, and the results were expected to indicate that K2Ti6013 be utilized as the acoustic absorbing materials at high temperature.

Fujiki, Y *JSAE Review* No. 6, HS-032 817, Nov. 1981, pp 91-97, 9 Fig., 5 Tab., 23 Ref.

Acknowledgment: National Highway Traffic Safety Administration
Order From: Society of Automotive Engineers of Japan, Inc, 10-2 Goban-cho, Chiyoda-ku, Tokyo 102, Japan

362428

HOW TO BUY A HELMET

Requirements that must be met by a good quality helmet are discussed, the different types of helmets are described, and the ways in which they provide protection for the head are outlined. A helmet must always fit snugly and have a double "D" ring fastener. Most manufacturers recommend an examination of the helmet after an accident. The stickers inside the helmets which represent various government and industry standards are explained in this article. The helmet is an impact-resisting container for the head which must prevent objects from entering the head and absorb impact energy. The helmet has a deformable shell and liner. The best shells are hand-laminated using woven fiberglass cloth and polyester resin. Helmet performance is measured by destroying test helmets under conditions that duplicate some accidents. Three commonly used standards are those of D.O.T., ANSI Z90.1 and Snell.

Driver Vol. 15 No. 7, HS-032 830, Dec. 1981, 8p

Acknowledgment: National Highway Traffic Safety Administration
Order From: GPO

362429

WHAT'S THAT NOISE? PART THREE

Unusual noises that cars make are annoying and distract attention from driving. Even minor distractions such as "pinging" can cause near misses, minor accidents and sometimes major accidents. These unusual noises are indications of items needing maintenance or repair. Interpreting these audible clues is a major undertaking for any backyard mechanic and something all drivers should attempt to understand. In the October and November 1981 DRIVERs we covered general engine and drive train noises. This installment considers sounds unique to certain American Motors, Chrysler Corporation and Ford Motor Company vehicles. In part four of "What's That Noise?" General Motors cars will be discussed.

Driver Vol. 15 No. 7, HS-032 832, Dec. 1981, pp 22-25

Acknowledgment: National Highway Traffic Safety Administration
Order From: GPO

362430

REPORT ON TRAFFIC ACCIDENTS AND INJURIES FOR 1979-1980. THE NATIONAL ACCIDENT SAMPLING SYSTEM

This report emphasizes the magnitude, characteristics and consequences of motor vehicle traffic accidents in the United States. It is based on information obtained through the National Accident Sampling System in 1979 and 1980.

Comsis Corporation, National Highway Traffic Safety Administration HS-806 169, Feb. 1982, 90p, 16 Fig., 50 Tab., 4 App.

Acknowledgment: National Highway Traffic Safety Administration
Order From: National Highway Traffic Safety Administration, National Center for Statistics and Analysis, Washington, D.C., 20590

362431

ACTS ADMINISTERED BY THE NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION, MARCH 1982 EDITION

This edition reviews the Highway Safety Act of 1966, the Motor Vehicle Information and Cost Savings Act, and the National Traffic and Motor Vehicle Safety Act of 1966.

National Highway Traffic Safety Administration HS-806 161, 1982, pp 92-242

Acknowledgment: National Highway Traffic Safety Administration
Order From: National Highway Traffic Safety Administration, 400 7th Street, SW, Washington, D.C., 20590

362462

AUTOMATED ACCIDENT LOCATION SYSTEMS

The paper reports that the states of Kentucky and North Carolina commissioned a consulting firm to provide assistance in their respective use of computer techniques in accident location methodology. Each state had different requirements to be met and different existing methods for processing accidents, as described. This paper describes the research and development performed cooperatively for the state agency.

Decker, JD (Smith (Wilbur) and Associates) Hawkins, RW *ASCE Journal of Transportation Engineering* Vol. 108 No. TE2, Mar. 1982, pp 197-206, 5 Ref.

Acknowledgment: EI
Order From: ESL

364847

TRANSPORTATION OF HAZARDOUS MATERIALS

This bulletin covers approaches to dealing with incidents involving hazardous materials in transport with the legal and safety issues as a key concern. Planning and training in response to vehicles transporting hazardous materials is addressed. The report also includes summaries of exemplary state local programs, and describes Federal activity on the topic.

Public Technology, Incorporated, Office of the Secretary of Transportation DOT-I-80-46, Sept. 1980, 64p

Sponsored in part by Urban Consortium for Technology Initiatives. Contract DOT-OS-80076

Acknowledgment: NTIS
Order From: NTIS PB82-154071

364974

CLOSED LOOP CONTROL OF AUTOMOTIVE ENGINES

Internal combustion engine economy and emissions are known to be sensitive to changes in engine control variables. Two of the most important variables are fuel/air ratio (f/a) and spark advance. These variables are affected by environmental changes, manufacturing tolerances, and time degradation. The combined effect of all these changes can cause as much as a 15% loss in economy and a 30% increase in emissions. This research concerns the application of optimization theory to develop control laws for use in closed loop control strategies to minimize the effect of the variables discussed above. The report describes the automated dynamometer facility developed for the acquisition of engine mapping data. This data was used to develop analytical functions describing the fuel consumption and emissions at each of 10 torque/RPM points. The functions were used by an optimization procedure to arrive at control strategies and driving cycle predictions of fuel consumption and emissions. The optimum schedules were then used to determine a closed-loop control strategy.

Powell, JD Glaser, I Randall, K Hosey, R
Stanford University, National Highway Traffic Safety Administration, Transportation Systems Center, (DTS-323) Final Rpt. DOT-TSC-NHTSA-81-12, HS-805 874, Dec. 1981, 316p, Figs., Tabs., Refs., 11 App.
Contract DOT-TSC-1466

ACKNOWLEDGMENT: NTIS
ORDER FROM: NTIS PB82-164088

364983

COLLISION DEFORMATION CLASSIFICATION TRAINING PROGRAM: INTERMEDIATE LEVEL-TRAINING/REFERENCE MODULE

This training module was prepared for the National Highway Traffic Safety Administration (NHTSA) of the U.S. Department of Transportation. The module describes the Collision Deformation Classification (CDC) system which is used in the National Accident Sampling System (NASS) and other accident data collection programs to describe direct contact damage sustained by light trucks and automobiles. Primary emphasis is placed on providing field personnel with additional information and coding directives which, in turn, result in more uniform and precise application of the CDC. Approximately twenty-four study hours are required to complete the module.

Hendricks, DL
Calspan Field Services, Incorporated, National Highway Traffic Safety Administration 6388-Y-1, HS-806 061, July 1981, 277p, Figs., Tabs., 92 Phot.
Contract DOT-HS-8-02026

ACKNOWLEDGMENT: NTIS
ORDER FROM: NTIS PB82-182510

364985

AUTOMATIC SAFETY BELT SYSTEMS: CHANGES IN OWNER USAGE OVER TIME IN GM CHEVETTES AND VW RABBITS

Follow-up interviews were conducted with 417 owners of 1978-1979 Chevettes and with 441 owners of 1978 Rabbits. Both makes of cars when purchased had automatic restraint and starter interlock systems. This follow-up study had the following two basic objectives: (1) To determine any decrement in use of the automatic restraint system, and (2) To assess any change in owners' attitudes toward the automatic restraint system over a two year period. Findings from the current study when compared with those from the earlier study are helpful in trying to predict any potential decrement over time of automatic safety belt usage should all cars produced in the future come equipped with automatic restraint systems. It should be recognized, however, that both these earlier model Chevettes and Rabbits have a starter interlock which tends to have a positive effect on belt usage while cars manufactured in the future are not likely to include a starter interlock.

Phillips, BM
Opinion Research Corporation, National Highway Traffic Safety Administration Final Rpt. 51674, HS-806 058, Aug. 1981, 25p, 7 Fig., 1 App.
Contract DTNH22-81-Q-07429

ACKNOWLEDGMENT: NTIS
ORDER FROM: NTIS PB82-182981

364987

SPECIAL TRAINING IN INJURY CODING

This report presents the background concerning and discusses the training materials developed under this contract in support of the National Accident Sampling System (NASS). Materials developed are aimed at improving the quality of injury coding by NASS investigators. The injury coding process is conceptually divided into five major substantive tasks and one appreciative task. Course materials were developed for tasks one through three. The instruction takes the investigator from encountering injury data in its natural context to being able to list encoded descriptions of injury in accordance with the Occupant Injury Classification (OIC) system and Abbreviated Injury Scale (AIS) protocols on the appropriate NASS forms.

Drahos, RW
Indiana University, Bloomington, National Highway Traffic Safety Administration Final Rpt. HS-806 060, June 1981, 38p, 3 App.
Contract DOT-HS-8-02010

ACKNOWLEDGMENT: NTIS
ORDER FROM: NTIS PB82-183633

364988

WORKSHOP TO REVIEW PROBLEM-BEHAVIOR RESEARCH PROGRAMS: PEDESTRIAN, BICYCLE, AND PUPIL TRANSPORTATION SAFETY

This report presents the proceedings of a workshop on pedestrian, bicycle, and pupil transportation safety. The purpose of this workshop was to develop specific recommendations for the planning and implementation of NHTSA research, development, and demonstration projects in the program area of Pedestrian, Bicycle, Pupil Transportation Studies. Workshop participants represented both the practitioner and researcher communities. Specific program elements were reviewed in-depth. Two working groups participated in a series which dealt with the following topics: Research and Development; Traffic Safety Programs; and Technology Transfer. This report summarizes discussions of these topics. Recommendations about specific program elements concerning the direction of future research in this area are presented.

Marks, ME McNair, JW Jones, RK Joscelyn, KB
Highway Safety Research Institute, National Highway Traffic Safety Administration Final Rpt. UM-HSRI-81-22, HS-806 057, Sept. 1981, 131p, Figs., 4 App.
See also PB81-220725.
Contract DOT-HS-8-02031

ACKNOWLEDGMENT: NTIS
ORDER FROM: NTIS PB82-183658

364989

IMPROVEMENT OF METHODS FOR DETERMINING PRE-CRASH PARAMETERS FROM SKID MARKS

This report presents the results of an experimental study, the goal of which was to validate and improve the methods currently used by accident reconstructionists to determine precrash parameters from skid marks. The three major issues concentrated on by this study were to validate or improve the currently used skid mark length versus prebraking speed formulas; to determine which method of measuring the coefficient of friction between the tire and the road produces the best results; and to see if unlocked wheels could produce skid marks. Six vehicles, three cars and three trucks, were tested during this study. The vehicles were tested with a variety of tire types and vehicle loadings on three different pavements. Both severe (wheels locked) and moderate (no wheels locked) stops were made from five speeds ranging from 10 to 60 mph. Prebraking speed, stopping distance and the length of the skid marks produced were determined for each stop. Stripchart recordings showing, as functions of time, distance travelled, speed, applied brake pedal force, longitudinal deceleration and the rotational rate of each wheel were also made. Regression analyses were performed to see how well the currently used skid mark length versus prebraking speed formulas and two modified forms of the currently used formulas fit the experimental data. These analyses showed that the currently used formulas provided an excellent fit to the test data. Furthermore, neither of the modified formulas were able to better explain the test data.

Garrot, WR Guenther, D Houk, R Lin, J Martin, M
National Highway Traffic Safety Administration, (NRD-52) Final Rpt. SRL-25, HS-806 063, May 1981, 167p, Figs., Tabs., 4 Ref., 1 App.
Prepared in cooperation with Vehicle Research and Test Center, East Liberty, OH.

ACKNOWLEDGMENT: NTIS
ORDER FROM: NTIS PB82-183716

364990

COMPLIANCE TECHNIQUES FOR PEDESTRIAN PROTECTION: FEASIBILITY STUDY

A study has been conducted to: (1) devise a compliance test methodology and criteria for the incorporation of potential injury mitigating modifications into the front end of motor vehicles; (2) design, fabricate, and test a candidate compliance test device; (3) demonstrate that the resulting methodology and test requirements generate structures which are consistent with the intent of the proposed compliance techniques and criteria. A pedestrian safety compliance test methodology has been developed for bumper contact with the knee/leg area, and data have been obtained that: (1) represent several kinds of recent vehicle front end designs; (2) demonstrate the flexibility available to a designer in the use of foamed polymers (e.g., polyurethane); (3) characterize the velocity and temperature sensitivities that must be considered in utilizing such design concepts. It has been shown that safety performance levels can be achieved while (1) approaching low-speed damageability capabilities; (2) using contemporary vehicle space allocation and material.

Vergara, RD Pritz, HB Herridge, JT Goodnight, TW Hassler, CR
Battelle Columbus Laboratories, National Highway Traffic Safety Administration Final Rpt. HS-806 059, Jan. 1981, 122p, Figs., 24 Tab., 11 Ref., 1 App.
Contract DOT-HS-5-01218

ACKNOWLEDGMENT: NTIS
ORDER FROM: NTIS PB82-183724

364993

EVALUATION OF PASSIVE BELTS FOR DIFFERENT SIZE OCCUPANTS

The report presents results from fifteen additional sled tests of the Volkswagen passive belt restraint system with Part 572 50th percentile male dummies in 90 degrees lateral, 30 degrees oblique and frontal impacts. The main objective of these tests was to examine how the performance of the restraint was affected by different orientations of the belt within the comfort zone. The test data exhibit a trend of improved performance as the belt is positioned higher and at a steeper angle across the torso in that the tendency to roll over the belt is reduced. It is concluded that the proposed belt fit compliance test procedures do not yield repeatable and realistic results for the belt position and hence are unsatisfactory for the intended purpose.

DeLeys, NJ
Calspan Advanced Technology Center, National Highway Traffic Safety Administration Final Rpt. CALSPAN-6407-V-5, HS-806 056, Jan. 1981, 330p, 7 Fig., 4 Tab., 3 Ref., 3 App.
Contract DOT-HS-8-02045

ACKNOWLEDGMENT: NTIS
ORDER FROM: NTIS PB82-184847

365132

REDUCING LEAKAGE OCCURRING IN OVERTURNS OF LIQUID-CARRYING CARGO TANKS

Product retention items on MC 306-type cargo tanks which represent potential leakage points in overturn accidents were identified in pressure tests of 61 cargo tanks at carrier sites and laboratory tests of 119 pressure/vacuum vents. The manhole assembly, loading/unloading venting, and pressure-actuated venting devices were identified as primary leakage sources in overturn accidents. The results of this survey indicated that: (1) the large carriers were performing systematic maintenance on their cargo tanks, but small carriers were not; (2) maintenance performed on cargo tanks is directed primarily to vehicular components; and (3) most carriers do not perform adequate maintenance on product retention items. A cargo tank compartment overturn simulator was designed and constructed, then used in 90 degrees and 180 degrees tests of new and used manhole assemblies and venting devices. These tests identified pressure-actuated venting in filler covers and loading/unloading venting as the primary sources of overturn leakage. Regulation changes were formulated and presented to an industry representation. On the basis of program test results and industry evaluation, changes are recommended to Parts 173, 177, and 178 (49 CFR) to: (1) require leakage checks before tanks are operated, (2) increase frequency and scope of inspections and maintenance, and (3) instill overturn integrity as a construction and maintenance requirement throughout the operating life of MC 306-type tanks.

Tyndall, LH
Dynamic Science, Incorporated, Bureau of Motor Carrier Safety 8337-81-112-1936, Nov. 1981, 27p
Contract DOT-FH-11-9494

ACKNOWLEDGMENT: NTIS
ORDER FROM: NTIS PB82-198243

365135

COST-EFFECTIVE METHODS OF REDUCING LEAKAGE OCCURRING IN OVERTURNS OF LIQUID-CARRYING CARGO TANKS: OVERTURN INTEGRITY OF MC 306-TYPE CARGO TANKS

Product retention items on MC 306-type cargo tanks which represent potential leakage points in overturn accidents were identified in pressure tests of 61 cargo tanks at carrier sites and laboratory tests of 119 pressure/vacuum vents. The manhole assembly, loading/unloading venting, and pressure-actuated venting device were identified as primary leakage sources in overturn accidents. Maintenance practices of 10 carriers were surveyed. Most large carriers perform systematic maintenance on their tanks, but small carriers do not. In general, maintenance done on cargo tanks is devoted primarily to vehicular components, and most carriers do not perform adequate maintenance on product retention items. A cargo tank compartment overturn simulator was designed and constructed, then used in 90 degree and 180 degree tests of new and used manhole assemblies and venting devices. These tests identified pressure-actuated venting in filler covers and loading/unloading venting as the primary sources of overturn leakage. Regulation changes were formulated and presented to an industry representation. On the basis of program test results and industry evaluation, changes are recommended to Parts 173, 177, and 178 (49 CFR) to: (1) require leakage checks before tanks are operated, (2) increase frequency and scope of inspections and maintenance, and (3) instill overturn integrity as a construction and maintenance requirement throughout the operating life of MC 306-type tanks.

Tyndall, LH Laananen, DH Gauthier, D
Dynamic Science, Incorporated, Federal Highway Administration Final Rpt. 8337-80-146, Sept. 1980, 558p
Contract DOT-FH-11-9494

ACKNOWLEDGMENT: NTIS
ORDER FROM: NTIS PB82-199936

365157

FEASIBILITY AND CONCEPT SELECTION OF A SAFETY HAZARD ADVANCE WARNING SYSTEM (SHAWS). VOLUME II. TECHNICAL REPORT

The document describes alternative approaches to the development of a practical concept for SHAWS and identifies the most appropriate technological and operational form. The document presents the results of the preliminary design and development of the electronic components using pulse position modulation of a carrier signal in the low band of the VHF designation of the communication frequencies. A discussion of the frequency selection considerations of receiver cost and transmitter power requirements is present. System circuit options are included. Considerations of the human factors aspects of driver response and operational effectiveness of SHAWS are addressed. Lastly, a preliminary cost and benefit analysis is presented.

Meyer, JR Reaser, JM Keller, R Wilson, RA Vadeboncoeur, JR
Commonwealth Research Corporation, Federal Highway Administration Final Rpt. FHWA-RD-81-124, CRC-46001-80-4, Apr. 1982, 262p
Contract DTFH61-80-C-00084

ACKNOWLEDGMENT: NTIS
ORDER FROM: NTIS PB82-202474

366500

ALCOHOL FROM A TO Z. INFORMATION CONCERNING ALCOHOL AND TRAFFIC

This report discusses in alphabetic order those concepts which are closely related to the topic of the dangers of alcohol as related to traffic safety. It is impossible to avoid use of the foreign terms which have become customary in the expert world since they are used frequently by medical experts in the courtroom as well as in written and oral judgements. An explanation of these foreign terms should make understanding somewhat simpler for the layman.

Smith, P, Translater
Federation to Combat Drunk Driving e.V. 7th Ed. HS-032 860, 1981
Reference copy only. Text in English and German.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: Federation to Combat Drunk Driving e.V., Alsterchaussee 17, 2000 Hamburg 13, West Germany

366501

ALCOHOL AND TRAFFIC. SECOND ASSESSMENT OF THE FEDERAL HEALTH AGENCY

This report discusses the problems encountered from the standpoint of epidemiology and statistics when an attempt is made to statistically check the effectiveness of the Law to Amend the National Traffic Law Dated July 20, 1973. The "0.8 per thousand Law" of the German Federal Government is intended to prevent a driver with a BAC which demonstrably increases his accident risk from participating in motorized driving and/or remove him from traffic. Two parameters for ascertaining the effectiveness of this Law are: (1) the percentage of traffic-relevantly inebriated drivers and (2) the number of traffic accidents involving personal injury caused by alcohol-influenced drivers. Processes which might yield scientifically irreproachable results for item 1 are found not applicable for the foreseeable future in the Federal Republic of Germany. Quantitative data with regard to item 2, it is found, should be used only with caution and subject to as many as possible other accident causative or promoting factors and on the basis of a fairly realistic assessment of deficiencies.

Lundt, PV Smith, P, Translater *Schriftenreihe* No. 52, HS-032 878, 1977, 50p, 2 Fig., 13 Tab., 80 Ref.
Reference copy only. Text in English and German. With the elaboration of St. Berg, J. Gerchow, O. Gruener, U. Heifer and W. Janssen.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: Esdar (E) KG, Bochum, West Germany

366502

IMPROVED LOW-BEAM PHOTOMETRICS

It is recognized that low-beam headlamps do not provide adequate illumination for safe operation at higher speeds. This report summarizes Task 1 activities on a contract the ultimate aim of which is to provide specifications for an improved low-beam headlighting system. A comprehensive review of the literature was carried out. Additional studies were conducted to provide information lacking in the available literature. Based on these data and the use of a computerized seeing-distance model, modifications to the present low-beam headlighting system were suggested, which should improve visibility distances under most driving conditions. A number of additional analyses have been carried out to determine whether the proposed beam modifications would cause problems under certain common driving conditions. For example, consideration was given to the effects of beam misaim, changes in mounting height, and adverse weather. None of the conditions examined appears to pose an overwhelming problem for the new beam system. The report concludes with a consideration of ways in which the new beam might be realized in hardware. There are a variety of ways in which this might be accomplished, all of which have advantages and disadvantages.

Olson, PL Sivak, M
Highway Safety Research Institute, (017796) Intrm Rpt. UM-HSRI-81-4, HS-032 851, Feb. 1981, 107p, Figs., 10 Tab., Refs., 4 App.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: Highway Safety Research Institute, Huron Parkway and Baxter Road, Ann Arbor, Michigan, 48109

366503

THE EFFECTS OF BELT USAGE MISCLASSIFICATION ERRORS ON SEAT BELT EFFECTIVENESS ESTIMATES

The objective of this study is to investigate the extent of biases in the police and occupant reported belt usage classifications (relative to a standard observer as represented by the NHTSA-sponsored investigating team), and the effects these biases have on the belt effectiveness estimate. The data used is the Restraint System Evaluation Program File (RSEP) provided by NHTSA. The study revealed that there is a significant amount of agreement (80%) between occupant and investigator concerning belt usage. There is also a significant amount of agreement (70%) between police and investigator on belt usage, but the agreement is significantly less than that between the occupant and investigator. Despite the presence of significant amounts of agreement between occupant and investigator, and between police and investigator, relative to the disagreements, the occupant consistently tends to overstate belt usage (bias = 0.6) whereas the police tendency to understate belt usage (bias = -0.17) is not as consistent. There is a stronger tendency for police to understate belt usage (bias = -0.44) when the occupants were injured than when they were uninjured (bias = -0.14). More specifically, when investigator reported belt not used, 18.2% of the occupants reported belt used and 26.3% of the cases were reported by police as belted. On the other hand, when investigator reported belt use, only 3.5% of the occupants reported belt not used, while 33.1% of the cases were reported by police as unbelted.

Chi, GYH
North Carolina University, National Highway Traffic Safety Administration Final Rpt. HSRC PR86, HS-032 852, Feb. 1980, 79p, Figs., Tabs., Refs., 7 App.
Contract DOT-HS-4-00897

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: North Carolina University, Highway Safety Research Center, Chapel Hill, North Carolina, 27514

366504

URBAN TRAFFIC SIGNAL CONTROL FOR FUEL ECONOMY. PART 2: EXTENSION TO SMALL CARS

Use of a small car's characteristics in a simulation program utilizing velocity profiles obtained in a traffic study by the Metropolitan Toronto Roads and Traffic Department and the Engine Laboratory at the National Research Council Canada has shown that trends shown in fuel consumption in NRC, Division of Mechanical Engineering Report No. ME-247 are similar for a samll-engined vehicle. NRC, DME Report No. ME-247 showed that under the TRANSYT timing plan, vehicles encountered fewer stops, saved time and used a slightly smaller amount of fuel than under the existing timing plan. In the above mentioned report a large vehicle's fuel consumption was calculated using a computer model of the vehicle which used velocity profiles obtained from an instrumented "floating" car.

Messenger, GS
National Research Council of Canada NRC 19846, HS-032 862, Nov. 1981, 8p, 3 Fig., Refs.
For Part 1, see HS-028 863

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: National Research Council of Canada, Division of Mechanical Engineering, Ottawa, Ontario K1A 0R6, Canada

366505

HELMET IMPACT TEST SYSTEM DEVELOPMENT

Protective head gear is currently evaluated using several ANSI guidelines, such as ANSI 789.1. The rigid headform specified in this standard does not realistically represent the head-neck-torso complex of the potential helmet wearer; further, the impact conditions specified therein do not simulate the variety of impact conditions encountered in actual industrial accident. The objectives of this project were to: (1) examine the literature to define the required impact characteristics, (2) identify the unavailable data then conduct tests to obtain such data, (3) develop a helmet impact test system based on acquired response data, and finally, (4) construct such a device and deliver it along with its user's manual. These objectives were met, and the work leading to the final goal is described in this final report. The device itself is delivered separately along with all engineering drawings and the assembly and operation manual.

Alem, NM
Highway Safety Research Institute, National Institute for Occupational Safety & Hlth Final Rpt. UM-HSRI-80-72-1, HS-032 863, Aug. 1980, 230p, 176 Fig., 1 App.
Contract 210-78-0016

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: Highway Safety Research Institute, Huron Parkway and Baxter Road, Ann Arbor, Michigan, 48109

366506

HELMET IMPACT TEST SYSTEM OPERATION AND ASSEMBLY MANUAL

Protective head gear is currently evaluated using several ANSI guidelines, such as ANSI 789.1. The rigid headform specified in this standard does not realistically represent the head-neck-torso complex of the potential helmet wearer; further, the impact conditions specified therein do not simulate the variety of impact conditions encountered in actual industrial accident. The objectives of this project were to: (1) examine the literature to define the required impact characteristics, (2) identify the unavailable data then conduct tests to obtain such data, (3) develop a helmet impact test system based on acquired response data, and finally, (4) construct such a device and deliver it along with its user's manual. These objectives were met, and the work leading to the final goal is described in the final report. The device itself is delivered separately a long with all engineering drawings and this assembly and operation manual.

Alem, NM
Highway Safety Research Institute, National Institute for Occupational Safety & Hlth UM-HSRI-80-72-2, HS-032 864, Aug. 1980, 27p, Phots. Contract 210-78-0016

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: Highway Safety Research Institute, Huron Parkway and Baxter Road, Ann Arbor, Michigan, 48109

366507

CONSUMERS NEED MORE RELIABLE AUTOMOBILE FUEL ECONOMY DATA

Since 1976, purchasers of new automobiles in the United States have relied on fuel economy test data to help choose fuel-efficient vehicles. Under a fuel economy labeling program administered by the Environmental Protection Agency (EPA) in cooperation with the Departments of Transportation and Energy and the Federal Trade Commission, every automobile manufactured for sale and use in the United States is required to display a label showing its tested fuel economy, its estimated annual fuel costs, and the fuel economy range of comparable vehicles. A Gas Mileage Guide, containing data on all automobile fuel economy test results, is published annually. Since the program began, there have been complaints of discrepancies between EPA's fuel economy test results and consumers' reported on-road fuel economy. For combined city/highway driving, recent statistics show that the discrepancies varied from 12 percent in 1975 to 20 percent in 1977 to 16 percent in 1979. Any projected fuel savings that have not recognized these discrepancies are therefore overstated. This report was prepared in response to a request from the House Committee on Energy and Commerce, which asked GAO to determine why these discrepancies exist, whether better measures of fuel economy can be developed, and whether better ways of disseminating this information to consumers can be devised.

General Accounting Office CED-81-133, HS-032 877, July 1981, 26p
Report to the Chairman, Committee on Energy and Commerce, House of Representatives.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: GAO-Document Handling & Info Services Facility, P.O. Box 6015, Gaithersburg, Maryland, 20760

366508

THE IMPACT OF ALCOHOLIC BEVERAGE ADVERTISING

This article reviews a landmark study on the impact of alcoholic beverage advertising. The study was commissioned by the federal government in 1978 when it became apparent that there was a need for objective data to shed light on this controversial issue. Principal researchers for the $96,000 project were Dr. Martin Block, Chairman of the Department of Advertising at Michigan State University, and Dr. Charles Atkin, Professor of Communications at Michigan State University. The project was completed in December 1979, but remained buried in the federal bureaucracy for nearly two years. The report is now available through the NTIS (PB82-123142). The principal findings as reviewed in this article cover these areas: alcohol advertising distribution and exposure; brand awareness and alcohol knowledge; images of drinkers; attitudes toward drinking; brand preferences; youth drinking; adult drinking; heavy or excessive drinking; drinking and hazardous activities; and responses to selected advertising appeals.

The Bottom Line Vol. 4 No. 4, HS-032 857, 1981, pp 2-17, Phots.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: American Business Men's Research Foundation, Michigan National Tower, Suite 1208, Lansing, Michigan, 48993

366509

THE EFFECT OF CAR SIZE ON HEADWAYS IN FREELY FLOWING FREEWAY TRAFFIC

In order to determine the effect of car size on freeway capacity, headways were measured and vehicles classified by size for 20,500 vehicles in near-capacity traffic on a Detroit freeway. The data were obtained using a videotape recorder system. Vehicle arrival times were measured from a videotaped image of the oncoming traffic using a photodetector mounted on the monitor screen. Size classifications were made by an observer from the pictures of each vehicle on the monitor. Average headways increased monotonically with lead car size from 1.87 s for "small" cars to 2.02 s for "large" cars. These differences are significantly greater than the differences expected from the greater road space occupied by the larger cars if the front bumper to rear bumper separation were independent of car size. The effect of following car size was nonmonotonic with the shortest average headways, 1.90 s, observed for "medium" following cars, and essentially equal headways of 1.99 s for "small" cars and 2.00 for "large" cars. The observed car size effects were found for long as well as for short headways. The net result of these effects would be an 8% increase in freeway capacity if the cars observed in the study were all replaced with small (subcompact) cars.

Wasielewski, P (General Motors Research Laboratories) *Transportation Science* Vol. 15 No. 4, HS-032 849, Nov. 1981, pp 364-378, 3 Fig., 4 Tab., 8 Ref.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: Operations Research Society of America, 428 East Preston Street, Baltimore, Maryland, 21202

366510

ALL-DIGITAL SIMULATION OF SIMPLE AUTOMOBILE MANEUVERS

A new, all-digital simulation describes straight-line acceleration and braking of an automobile. The model has five degrees of freedom: longitudinal velocity, vertical velocity, pitch angular velocity, and the angular velocities of the front and rear wheels. The model is capable of handling severe maneuvers. Special provisions allow the user to include antilock systems, average suspension forces, perform braking studies, and assess the importance of nonlinear terms. A validation study shows a close comparison with results from earlier models. The model is modular, well-documented, and readily available to researchers in a convenient form.

Mitchell, B Abrams, R Scott, RA (Michigan University, Ann Arbor) *Simulation* Vol. 17 No. 6, HS-032 846, Dec. 1981, pp 179-186, 14 Fig., 2 Tab., 10 Ref.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: Simulation Councils, Incorporated, P.O. Box 2228, La Jolla, California, 92038

366511

IMPROVED AUTOMOBILE FUEL ECONOMY: KEY TO REDUCED PETROLEUM DEPENDENCE

The purpose of this paper is to suggest answers for three key question regarding achievement of fuel economy levels of 50-60 mpg by the mid-1990's. These questions are as follows: (1) Are technologies available which will yield greatly improved levels of fuel economy at a reasonable cost? (2) Will the market alone take the nation to economically and technologically feasible levels of fuel economy? (3) What policies might the federal government pursue to assure, for the national interest, attainment of high fuel economy levels?

Holtzman-Parcells, H
Environmental Policy Institute HS-032 845, Nov. 1981, 42p, 6 Fig., 9 Tab., 74 Ref., 1 App.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: Environmental Policy Institute, 317 Pennsylvania Avenue, SE, Washington, D.C., 20003

366512

INTERNATIONAL YEAR OF DISABLED PERSONS 1981

This publication contains the proceedings of an International Conference on the adaption of the physical environment for the full participation of the disabled. Held on May 5-7, 1981 in Gothenburg, Sweden, the conference was arranged by the International Federation of Pedestrians in cooperation with the Swedish Trade Fair Foundation and the Central Committee on National Associations of the Handicapped in Sweden. The proceedings consist of a list of resolutions accepted by the delegates at the conclusion session on May 7, 1981, opening remarks and greetings, papers presented, comments on a film shown during the conference, and received papers. The papers cover these areas: medical and social aspects, disability policies and measures to adapt the physical environment, transportation service arrangements, and physical adaptations for the visually disabled.

International Federation of Pedestrians HS-032 866, 1981, 250p, Figs., Phots., Apps.

Handicapped in the City, International Conference on the adaption of the physical environment for the full participation of the disabled, 5-7 May 1981, Gothenburg, Sweden. Organized in cooperation with the Swedish Trade Fair Foundation and the Central Committee on National Associations of the Handicapped in Sweden (HCK).

Acknowledgment: National Highway Traffic Safety Administration
Order From: International Federation of Pedestrians, Van Montfoortlaan 11, 2596 SN The Hague, Netherlands

366513

THE INFLUENCE OF ALCOHOL AND DRUGS ON DRIVING

This report contains a summation and recommendations from a study of the problem of alcohol and medical drugs as major risk factors in traffic accidents. The study was conducted by a Technical Group convened by the World Health Organization's Regional Office for Europe in collaboration with the Government of the Principality of Monaco. The following topics are examined: Drugs with a known effect on driving; Prospective studies on behavior indicators, classes of psychotropic substances and drugs interacting with alcohol to affect driving; Biological and analytical studies; Epidemiology; Monitoring the effect of legislation; and Psychosocial factors in the consumption of alcohol and medical and illicit drugs.

World Health Organization No. 38, HS-032 853, 1981, 30p, 45 Ref.

Report on a WHO Ad Hoc Technical Group, Monaco, 30 October-2 November 1978. EURO Reports and Studies 38.

Acknowledgment: National Highway Traffic Safety Administration
Order From: WHO Publications Centre USA, 49 Sheridan Avenue, Albany, New York, 12210

366514

EMERGENCY RADIO VOICE IN CARS (AUTONOTFUNK)--RESEARCH INTO THE NONTECHNICAL ASPECTS

This report describes the emergency radio voice system "Autonotfunk" (ANF) which was developed by AGE-Telefunken on behalf of the Federal Ministry for Research and Technology. The ANF combines the advantages of both the mobile (direct access independent of time and place) and the stationary (being sure that the report gets immediately where it is supposed to go) event reporting systems. In addition, the ANF renders possible verbal communications between the communications center and the caller, and automatic location identification by means of bearing. However, before introducing the ANF there are direct and indirect system effects which need to be examined. The remainder of this report addresses these system effects and offers an approach to a solution to the problems they create. [German/English]

Emser, J Gutmann, G Riediger, G Schlag, B Siegener, W Weissbrodt, G Willenberg, C
Federal Highway Research Institute HS-032 841, No Date, 47p, 6 Fig.

Acknowledgment: National Highway Traffic Safety Administration
Order From: Federal Highway Research Institute, Bruhlerstrasse 1, D-5000 Cologne 1, West Germany

366515

WHEN IS LEFT-TURN PHASING JUSTIFIED?

This article describes a method of analysis to aid in determining where left-turn phasing is justified. The method, developed by the Michigan Department of Transportation, utilizes the Network Simulation Model (NETSIM) to determine fuel consumption, delay, and emissions at intersections with and without left-turn phasing. Estimated accident reduction with left-turn phasing (from a study by the Kentucky Department of Transportation) is then compared with increased fuel consumption to determine the benefit/cost of proposed multiphase signal operation.

Etelamaki, GR (Michigan Department of Transportation) *ITE Journal* Vol. 52 No. 2, HS-032 871, Feb. 1982, pp 18-20, 2 Fig., 2 Ref.

Acknowledgment: National Highway Traffic Safety Administration
Order From: Institute of Transportation Engineers, 525 School Street, SW, Suite 410, Washington, D.C., 20024

366516

MOTOR VEHICLE SAFETY: PASSIVE RESTRAINTS VS. MANDATORY SEAT BELT WEARING

Stating that passive restraint requirements should not have been abolished without a comparison with an alternative course of action, this article makes that comparison with the alternative of implementaton and enforcement of a mandatory seat belt usage law. It presents safety, cost, and implementation related aspects of passive belts, airbags and belt use law. The overall effectiveness, cost effectiveness and personal freedom of these alternatives are also examined. The conclusion reached is that mandatory seat belt usage should be preferred.

Sheffi, Y (Massachusetts Institute of Technology) Brittain, DB *ITE Journal* Vol. 52 No. 2, HS-032 872, Feb. 1982, pp 26-29, 2 Tab.

Acknowledgment: National Highway Traffic Safety Administration
Order From: Institute of Transportation Engineers, 525 School Street, SW, Suite 410, Washington, D.C., 20024

366517

EPIDEMIOLOGY OF ACCIDENTS

This article examines the different features of accidents which are investigated. It includes all types of accidents, such as labor accidents, transit accidents, and home accidents. In the section on transit accidents, the following aspects are considered to be the most usual aspects investigated: absolute number of accidents; relative numbers--several rates are used (period under study, generally a year, is compared with others; types--the ones considering the total accidents and the ones considering the total casualties); total of registered vehicles; license holder drivers; estimate about the mileage fared; total number of deceases; number of disabling injuries; costs; gravity and frequency trend.

Huettich, RC *Journal of Traffic Medicine* Vol. 9 No. 4, HS-032 870, 1981, pp 61-64

For the first part of this article see HS-032 734, TRIS 362003.

Acknowledgment: National Highway Traffic Safety Administration
Order From: International Assn of Accident & Traffic Medicine, P.O. Box 10043, S-10055 Stockholm 10, Sweden

366518

THE PROTECTIVE EFFECT OF DIFFERENT KINDS OF PROTECTIVE CLOTHING WORN BY MOTORCYCLISTS

This article examines the use of different kinds of leather clothing and the protective effect it has for motorcyclists. Data were obtained by a questionnaire survey in which 131 motorcycle drivers responded out of 174 involved in an accident where injuries were sustained. Results indicate that leather clothing protects motorcycle drivers from soft tissue damage. Statistically significant results were obtained for leather trousers and gloves. The need is seen for further study to improve the protective effect of jackets and boots and to develop new shock absorbing materials for shoulders, elbows and wrists.

Aldman, B (Chalmers University of Technology, Sweden) Cacciola, I Gustafsson, H (Folksam Insurance Group) Nygren, A Wersall, J (Karolinska Hospital, Sweden) *Journal of Traffic Medicine* Vol. 9 No. 4, HS-032 869, 1981, pp 57-58, 3 Fig., 2 Tab., 7 Ref.

Acknowledgment: National Highway Traffic Safety Administration
Order From: International Assn of Accident & Traffic Medicine, P.O. Box 10043, S-10055 Stockholm 10, Sweden

366519

ACCELERATION HESITATION? YOU CAN MAKE YOUR CAR RUN SMOOTHLY AGAIN

A malfunction in one or more of six different systems under the hood can cause a cold engine to hesitate during acceleration. Checking out these systems usually uncovers the guilty culprit. A description of these systems--accelerator-pump system, choke system, thermostatic air cleaner, EGR system, intake-manifold heat control and distributor-advance unit--is given, along with an explanation of their operation and the necessary repairs.

Hill, R *Popular Science* Vol. 220 No. 2, HS-032 882, Feb. 1982, pp 114-116

Acknowledgment: National Highway Traffic Safety Administration

ORDER FROM: Times Mirror Magazines, Incorporated, 380 Madison Avenue, New York, New York, 10017

366520
ROBOTS TAKE DETROIT

More and more manufacturers are making newer and better robots for a growing variety of applicatons. In the United States automobile body spot welding accounts for most of the robot applications, followed by materials handling, arc welding and painting. Automatic assembly promises to become the most important robot application in the post 1985 period, and the industry is already developing the necessary more sophisticated hardware and software. Sales competition will continue to be intense as both the European and the Japanese robot makers battle U.S. firms for Detroit's attention.

McElroy, J *Automotive Industries* Vol. 162 No. 1, HS-032 856, Jan. 1982, pp 28-29

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: Chilton Company, Chilton Way, Radnor, Pennsylvania, 19089

366521
ROAD ACCIDENTS GREAT BRITAIN 1980

Contents: (1) List of Tables; (2) Notes and Definitions; (3) Index of Review Topics 1968-1980; (4) Review of Road Traffic Accidents in 1980; (5) Calendar of Measures affecting Road Traffic and Safety; (6) Index to Tables; and (7) Charts.

Department of Transport, England HS-032 865, 1981, 39p

Prepared in cooperation with the Scottish Development Department and the Welsh Office.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: Her Majesty's Stationery Office, Copyright Section, St. Crispins, Duke Street, Norwich NR3 1PD, England

366522
TRANSPORT STATISTICS GREAT BRITAIN 1970-1980

Contents : (1) Transport: An Overall View; (2) Road; (3) Rail; (4) Pipelines; (5) Water Transport; (6) Air Transport; and (7) International Comparisons.

Department of Transport, England HS-032 854, 1981, 140p

Prepared in cooperation with the Welsh Office and the Scottish Development Department.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: Her Majesty's Stationery Office, Copyright Section, St. Crispins, Duke Street, Norwich NR3 1PD, England

366523
1981 MOTORCYCLE STATISTICAL ANNUAL

The contents of this publication are: (1) The Motorcycle Market; (2) Manufacturers and Distributors; (3) The Retail Marketplace; (4) Motorcycle Usage; and (5) The Motorcycle Owner.

Motorcycle Industry Council, Incorporated HS-032 847, 1981, 46p

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: Motorcycle Industry Council, Incorporated, 1001 Connecticut Avenue, Suite 522, Washington, D.C., 20036

366524
TROUBLESHOOTING CLUTCHES ON WHEELED VEHICLES AND ADJUSTING CLUTCH LINKAGE, TRUCK, 1/4 TON, M151 SERIES

This job aid has been developed as a guide to show how to inspect and troubleshoot clutches on wheeled vehicles and adjust clutch linkages on M151 series vehicles or those equipped with disk clutches. These troubleshooting and adjustment tasks are designed to check the operation of the clutch. An improperly adjusted clutch can result in slippage, worn parts, and major repairs.

Army Ordnance and Chemical Center and School HS-032 873, No Date, 22p

Job Aid No. 610-091-6086-J

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: GPO

366525
INSPECTING THE STEERING SYSTEM OF A WHEELED VEHICLE

This guide has been developed as a reference for inspecting the steering system of M809 series 5-ton trucks. The inspections made are designed to pinpoint trouble spots in the steering system. It is important that these be identified before they develop into major repair items.

Army Ordnance and Chemical Center and School HS-032 874, No Date, 24p

Job Aid No. 610-091-6088-J.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: GPO

366526
EFFECT OF ENVIRONMENT ON CREEP AND SHRINKAGE

Experimental results for creep and shrinkage of a typical bridge building concrete are presented for specimens kept inside a laboratory and on top of, inside, and underneath a concrete box girder bridge. The environment is shown to have considerable effect on creep and shrinkage but it is concluded that location at the bridge was relatively unimportant. Code predictions of creep and shrinkage were close to experimental values provided that a suitable value of relative humidity was chosen.

Bryant, AH (Auckland University, New Zealand)
National Roads Board, New Zealand RRU Bulletin 57, HS-032 875, 1981, 30p, 5 Fig., 12 Tab., 6 Ref.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: National Roads Board, New Zealand, Road Research Unit, Wellington, New Zealand

366527
INSURANCE FACTS, 1981-82 EDITION

This yearbook is intended to provide some basic facts relating to the property and liability insurance business for editors, writers, speakers, teachers, students, insurance people and others. Insurance Facts is published annually by the Insurance Information Institute, an educational, fact-finding and communications organization for the property and liability insurance business. The Institute is supported by more than 200 insurance companies, both stock and mutual, and also provides public relations services to other organizations in the fields of property, liability, fidelity, surety and marine insurance.

Insurance Information Institute HS-032 876, 1981, 84p

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: Insurance Information Institute, 110 William Street, New York, New York, 10038

366528
INSURANCE LOSSES, COLLISION COVERAGES, PASSENGER CARS, VANS, PICKUPS, AND UTILITY VEHICLES--1981 MODELS DURING THEIR FIRST YEAR, 1980 MODELS DURING THEIR FIRST TWO YEARS, 1979 MODELS DURING THEIR FIRST THREE YEARS

This report describes the collision coverage loss experience of 1981 models during their frist year of availability, 1980 models during their first two years, and 1979 models during their first three years. Results are presented for passenger cars, vans, pickup trucks, and utility vehicles. This report is based on collision coverage and loss data supplied by nine insurers: Aetna, Allstate, GEICO, Kemper, Liberty Mutual, Nationwide, State Farm, Travelers, and USAA.

Highway Loss Data Institute HLDI R81-2, HS-032 859, Dec. 1981, 57p, 2 Fig., 12 Tab.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: Highway Loss Data Institute, Watergate 600, Washington, D.C., 20037

366529
RELATIVE MORTALITY OF UNBELTED INFANT PASSENGERS AND BELTED NON-INFANT PASSENGERS IN AIR ACCIDENTS WITH SURVIVORS

Aircraft accidents with survivors were examined to determine the relative risk of mortality for unrestrained infant passengers vs seat-belted adult passengers. The crude relative risk was estimated to be 7.1, based on US data, and 7.4, based on worldwide data. More refined estimates allow for possible effects of seat location and for differences in lethality between crashes. Using such estimates, unbelted infant passengers have relative risk of 5.9 based on US data and 9.6 based on worldwide data. The injury experience of restrained vs unrestrained automobile passengers suggests that the observed excess risk to infant air passengers may be related to the absence of a mechanical restraint system. Recommendations for a mechanical restraint system are made and the cost and benefits of implementing these recommendatons in the US are discussed.

File, D Rosner, B McKibben, W *American Journal of Public Health Reprint* Vol. 71 No. 11, HS-032 848, Nov. 1981, p 1242, 4 Tab., 18 Ref.

Acknowledgment: National Highway Traffic Safety Administration
Order From: American Public Health Association, 1740 Broadway, New York, New York, 10019

366530

BUILD PM'S UNDERCOVER AUTO COP

The Popular Mechanics Undercover Auto Cop is a sophisticated burglar alarm and it is also an auto voltmeter with which almost any electrical-system problem can be diagnosed. More importantly, the voltmeter provides the disguise to hide the alarm. The project can be built from kit or plans, and its construction and operation are described.

Sandler, J *Popular Mechanics* Vol. 155 No. 3, HS-032 867, Mar. 1982, 3p, 2 Phot.

Acknowledgment: National Highway Traffic Safety Administration
Order From: Hearst Magazines, 224 West 57th Street, New York, New York, 10019

366531

SERVICING GM'S J-CAR

Other than the names and a few trim and optional features, all the J-cars are mechanically identical. They all have the same transverse-mounted, 1.8-liter, four-cylinder ohv L-4 engine with the two-stage Rochester Varajet carburetor and almost all the specifications are the same. This article describes how to service the J-cars to "Saturday mechanics" at three levels of expertise: (1) check fluid levels; (2) change the oil and oil filter, replace spark plugs, adjust belts, lubricate the chassis and do all other maintenance services; and (3) make certain challenging repairs, possible only to those who know the ins and outs which are described here.

Schultz, M *Popular Mechanics* Vol. 155 No. 3, HS-032 868, Mar. 1982, pp 35-38, Phots.

Acknowledgment: National Highway Traffic Safety Administration
Order From: Hearst Magazines, 224 West 57th Street, New York, New York, 10019

366532

TROUBLESHOOTING IMPORTED ELECTRONIC IGNITIONS: HOW TO DEAL WITH POINTLESS PROBLEMS

While some imported electronic ignitions may look a little unfamiliar under the cap, they really are very similar to domestic units, and all of them can be tested by making simple resistance tests. This article supplies instructions and specifications for some of the recent, best-selling foreign makes: Volkswagen, Honda, Datsun and Toyota.

Stenquist, P *Motor* Vol. 157 No. 1, HS-032 844, Jan. 1982, 6p, Phots.

Acknowledgment: National Highway Traffic Safety Administration
Order From: Hearst Books, Motor Books Department, 224 West 57th Street, New York, New York, 10019

366533

DIAGNOSING IMPORTED FRONT ENDS: HAVING TROUBLE WITH MACPHERSON STRUTS OR RACK-AND-PINION STEERING? NOT IF WE CAN HELP IT

Invented in the U.S. in the late 1940s, the MacPherson strut suspension system neglected by Detroit for 40 years, has become overnight the support upon which every manufacturer's dream machine rests. Rack-and-pinion steering is generally used in conjunction with MacPherson struts. Advice on servicing both systems is given in this article. A partial list of cars that use MacPherson struts and rack-and-pinion steering is included.

Schultz, M *Motor* Vol. 157 No. 1, HS-032 843, Jan. 1982, 9p, Phots.

Acknowledgment: National Highway Traffic Safety Administration
Order From: Hearst Books, Motor Books Department, 224 West 57th Street, New York, New York, 10019

366537

DOWNHILL GRADE SEVERITY RATING SYSTEM

A grade severity rating system was developed as a means for reducing the incidence and severity of truck accidents on downgrades. The ultimate result is a roadside sign at the top of each hill. The sign is tailored to the individual hill and gives a recommended maximum speed (to be held constant for the entire grade descent) for each of several truck weight ranges. This concept represents a major step forward in terms of grade descent safety because it tells the driver what to do directly, rather than giving him information which still requires evaluation under different loading conditions.

Johnson, WA (Systems Technology, Incorporated) Myers, TT DiMarco, RJ Allen, RW *Society of Automotive Engineers Preprints* SAE 811263, 1981, 11p, 5 Ref.

Prepared for SAE meeting November 9-12, 1981.

Acknowledgment: EI
Order From: ESL

366565

ACCIDENT INVESTIGATIONS-A CASE FOR NEW PERCEPTIONS AND METHODOLOGIES

At least 5 different perceptions of the accident phenomenon, 44 different reasons for investigating accidents, 7 investigative processes, 6 general methodologies, and 3 differing types of output requirements affect accident investigations. These differences reflect the lack of a unifying conceptual framework for accident investigation and safety; corrupt data search, selection, organization and reporting decisions during investigations; and result in spurious accident data. A tentative unifying perception of accident phenomena, with supporting assumptions, principles and rules of procedure for their investigation was synthesized from the findings. Four games simulating the resultant accident investigation process have been developed. The process has been applied to improve hazardous materials emergency response decision making, and evaluation of safety countermeasures.

Benner, L, Jr (National Transportation Safety Board) *SAE Special Publications* SP-461, 1980, pp 27-44, 42 Ref.

SAE Special Publication, Accident Causation, Congress and Expo, held in Detroit, Michigan, February 25-29, 1980.

Acknowledgment: EI
Order From: ESL

366567

WHAT CAUSES ACCIDENTS-A SEMANTIC ANALYSIS

Semantic problems have biased traffic safety programs. This paper analyzes the arguments which have been put forward for and against using the words "accident" and "cause of an accident" and shows how attitudes towards these questions can influence attitudes towards countermeasures.

Haight, FA (Pennsylvania State University, University Park) *SAE Special Publications* SP-461, 1980, pp 51-54, 7 Ref.

SAE Special Publication, Accident Causation, Congress and Expo, held in Detroit, Michigan, February 25-29, 1980.

Acknowledgment: EI
Order From: ESL

366569

STATISTICAL METHODS FOR ANALYZING ACCIDENT RISK-A PROTOTYPE SYSTEM

This paper discusses the problems and prospects for a system for statistically analyzing relationships between pre-crash factors and accidents using accident data from the National Accident Sampling System. The paper presents a description and tentative results from a field trial of a prototype system, using exposure data newly collected for the field trial and pre-existing accident data.

Squires, ML (Indiana University, Bloomington) Hume, RD Hochberg, Y *SAE Special Publications* SP-461, 1980, pp 67-80, 3 Ref.

SAE Special Publication, Accident Causation-Congress and Expo, held in Detroit, Michigan, February 25-29, 1980.

Acknowledgment: EI
Order From: ESL

366762

ANTHROPOMETRIC PROFILE OF THE BRITISH CAR OCCUPANT. 1979/2

An anthropometric survey of British car drivers and front seat passengers measured seventeen dimensions required in the design of cars. The distributions of dimensions were obtained for the male and female driving populations, showing the variations with age, stature and weight. The survey data has been transferred to computer file for use in design studies, especially in mathematical models requiring parameters of drivers representative of the whole user population. In considering the effect on seating layout of the statistics of drivers and front seat passengers, no significant difference was found between female occupants of either front seat, but male drivers were found to be significantly older and heavier than male passengers, although there was little difference in stature. Comparison with the dimensions of the U.S. civilian population, which have been used up to now in European car design and legislation, showed that where male dimensions have been based on American statistics, they are adequate for the present British driving population, but British female drivers are significantly taller than U.S. civilian women. A factor analysis was used to explore the relationships between dimensions relevant to vehicle design. After normalisation to remove the influence of stature and weight on the other dimensions, three factors were extracted and used to construct a set of body indices which are suggested as shape parameters in the definition of a range of anthropometric dummies and models.

Haslegrave, CM Hardy, RN
Motor Industry Research Association HS-032 885, Nov. 1979, 74p, Figs., Tabs.

Acknowledgment: National Highway Traffic Safety Administration
Order From: Motor Industry Research Association, Watling Street, Nuneaton CV10 0TU, Warwickshire, England

366763

PREDICTION OF SEAT BELT FIT--COMPARISON BETWEEN A GEOMETRICAL MODEL AND WEARER PREFERENCE. 1980/1

A geodesic computer model was developed at MIRA for the assessment of seat belt fit. The technique has been validated by comparison between the predictions of the model and reports of subjective assessments of belt layouts. It has also been used to assess the comfort of installations in current cars for a group of six representative car occupants. The geodesic model was found able to predict certain qualities which wearers demand of seat belts, and suggestions are made for further improvements to refine the model and extend the technique to more complex problems of comfort.

Haslegrave, CM
Motor Industry Research Association HS-032 886, No Date, 16p, Figs., Tabs., 9 Ref.

Acknowledgment: National Highway Traffic Safety Administration
Order From: Motor Industry Research Association, Watling Street, Nuneaton CV10 0TU, Warwickshire, England

366764

DEVELOPMENT OF QUIET LOW BACK PRESSURE EXHAUST SILENCERS ON TWO SALOON CARS USING A PERFORMANCE PREDICTION COMPUTER PROGRAM. 1980/2

This report described the development of low back pressure, all reactive, exhaust silencer systems to assess the extent to which fuel consumption could be reduced, power output increased and silencer performance improved and rationalised by an experimental approach aided by a computer performance prediction program. The work was carried out on a small low power to weight ratio saloon car (LPWR) and a small high power to weight ratio saloon car (HPWR) which exhibited many of the constraints which affect silencer design and manufacture. The design targets for the exhaust systems of the LPWR vehicle of substantially lower back pressure (about 50% of O.E.) without detracting from the external noise requirement of EEC Directive 77/212/EEC were essentially met. On the HPWR vehicle a similar back pressure target and a more stringent (3 dBA better) performance compared to the O.E. exhaust system over the engine speed range bounding the EEC noise test were also substantially met. In spite of an increased volume (20-60% re O.E. silencer volume) the prototype silencers were fitted to the test vehicles without loss of ground clearance. The reduced back pressures of the silencers resulted in improvements of better than 3% in maximum power and better than 3.5% in specific fuel consumption at maximum power. The improved fuel consumption measured on the engine could not be detected on the vehicle on the ECE Urban driving cycle, but could be detected during tests at high (90 km/h) constant speeds. Although the design targets were substantially met, the computer aided design procedure proved to be of only limited success and much more basic research is required before drawing board design of exhaust silencers becomes a practicality.

Devlukia, JN
Motor Industry Research Association HS-032 887, No Date, 68p, Figs., Tabs., 27 Ref., Apps.

Acknowledgment: National Highway Traffic Safety Administration
Order From: Motor Industry Research Association, Watling Street, Nuneaton CV10 0TU, Warwickshire, England

366765

THE REDUCTION OF DIESEL ENGINE NOISE BY CLOSE SHIELDING. 1980/4

The lead shielding technique, vibration measurements and a specially designed test rig to simulate the vibration properties of an engine were used to design a number of close shielding systems for two diesel power units. The close shielding systems were applied to a small and large diesel power unit adopting the philosophy that the shielding should not interfere with access for maintenance and be a relatively permanent feature of the units. Noise reductions of up to 6 dBA were found possible on the bare power unit, but the reductions obtained on the vehicle were somewhat less owing to flanking by the noise from other sources. The reduction of interior noise was less in terms of dBA but significantly improved the subjective refinement of the vehicles. It is apparent from this work that the design of cost-effective acoustically efficient and mechanically reliable close shields for mass production engines which do not detract from the reliability of the power unit will only be achieved as a result of considerable development work.

West, J
Motor Industry Research Association HS-032 889, No Date, 158p, Figs., Tabs., 24 Ref.

Acknowledgment: National Highway Traffic Safety Administration
Order From: Motor Industry Research Association, Watling Street, Nuneaton CV10 0TU, Warwickshire, England

366766

THE FREQUENCY OF CLAIMS INVOLVING SALVAGE SUBCOMPACT AND COMPACT CARS. 1980 MODELS

This Highway Loss Data Institute report presents information on the frequency with which the more popular 1980 model year subcompacts and compacts generated collision coverage claim amounts greater than the replacement value of the car less its salvage value, with the result that the car was sold for salvage. This study was prompted by the fact that many cars with newer designs, in particular with front wheel drive and transverse mounted engine, often require the use of expensive equipment and techniques to repair their crash damage, compared with cars with traditional designs. This has raised concerns that these newer designs may more often be declared total losses because they are unrepairable. Principal findings are: (A) No evidence was found that the frequency with which the collision coverage claims involved salvage was greater for cars with front wheel drive and transverse mounted engines. The car with the lowest frequency and percentage of claims involving salvage, was the Oldsmobile Cutlass four-door--a compact model with rear wheel drive and separate frame. The car with the highest frequency and percentage of claims involving salvage was the Ford Pinto two-door--a small subcompact with rear wheel drive and a unitized body; (B) The results for the compacts suggest that cars with separate frames may have a lower frequency of collision claims involving salvage than cars with unitized bodies. Three of the four compact models with separate frames had the lowest frequency and percentage of claims with salvage among all of the cars studied; (C) There were no obvious relationships between the average amounts paid for the salvaged cars and their basic design features. The car with the lowest salvage recovery value was the Ford Pinto two-door--a small subcompact with rear wheel drive and unitized body. The car with the highest salvage recovery value was the Volkswagen Rabbit--a small subcompact with front wheel drive and unitized body; and (D) There was considerable variation among the cars in both the frequency of claims involving salvage and the average salvage recovery amounts.

Highway Loss Data Institute Res Rpt HLDI A-16, HS-032 890, Jan. 1982, 8p, 2 Tab.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: Highway Loss Data Institute, Watergate 600, Washington, D.C., 20037

366767
NOISE?
This is the fourth and final instalment on vehicle noises. It reviews noise unique to certain General Motors cars, diagnoses the problems and offers cures. Buick, Cadillac, Chevrolet, Oldsmobile and Pontiac Models are examined.

Driver Vol. 15 No. 8, HS-032 891, Jan. 1982, pp 22-25 For the 3 previous articles, see "Driver", October, November and December 1981.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: GPO

366768
WHAT EVERY CONSUMER SHOULD KNOW ABOUT WARRANTIES!
The "Magnusson-Moss Warranty Act", passed by Congress in 1975, helps the consumer choose the warranty he wants before he buys, and helps him make companies keep their promises after he buys. This article reviews all types of warranties--written-full-limited-spoken-implied--, explains the difference between a warranty (which is free) and a service contract (which is not free), the concept of "Consequential Damages", and finally counsels the consumer on what to do to avoid problems and what to do if and when he has problems.

Julian, EJ *California Highway Patrolman* Vol. 45 No. 11, HS-032 892, Jan. 1982, 5p

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: California Association of Highway Patrolmen, P.O. Box 2631, Sacramento, California, 95812

366769
ARE YOUR WINTER DRIVING HABITS SAFE ONES?
Guidelines are given for safe winter driving. They include: (1) Prepare your car for winter driving; (2) Carry in your car; (3) A word about tires; (4) Carbon monoxide, a special hazard; (5) Precautions for ice and frost; and (6) Review your winter driving skills.

Cruzic, K *California Highway Patrolman* Vol. 45 No. 11, HS-032 893, Jan 1982, 2p

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: California Association of Highway Patrolmen, P.O. Box 2631, Sacramento, California, 95812

366770
STATISTICAL ASPECTS OF INJURY SEVERITY. PART IV: MATCHED DATA
By matched data is meant information about two casualties in the same accident (or in very similar accidents that have been matched from a large dataset). The two casualties might differ in, for instance, which vehicle they were in, or whether they were or were not wearing a seat belt. Two strategies for the statistical analysis of such data are described. One explicitly models the probability of each combination of severities of injury. The second concentrates on a parameter describing how different are the severities to the two classes of casualty. Several datasets from two fields of application are presented and analyzed as matched data. The first field is the effect of mass ratio on the severities of injury to drivers of vehicles involved in head-on collisions. The second is the difference in severity between belted and unbelted car occupants. The same methods are applicable, of course, to the analysis of other factors. Finally, as an example of the extensions possible with such models, it is shown how it may be feasible to make a distinction between the effects on injury severity of vehicle design and of impact speed, without actually knowing the impact speeds of the accidents.

Hutchinson, TP (Coventry (Lanchester) Polytechnic, England) *Transportation Science* Vol. 16 No. 1, HS-032 894, Feb. 1982, pp 83-105, Figs., Tabs., 22 Ref.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: Operations Research Society of America, 428 East Preston Street, Baltimore, Maryland, 21202

366771
INSTABILITY IN THE HAND-BRAKE PERFORMANCE OF CARS AND VANS
Drum brakes of leading and trailing shoe design are commonly used on the rear axles of cars and vans, and their handbrake actuation is frequently accomplished by means of a strut between the two shoes. Occasional instability in the handbrake performance, which may culminate in brake lock and consequent shock loading of brake components, has been investigated experimentally and analytically. Lining friction and contact pattern, brake geometry and design are all considered as influencing factors and some unusual mechanisms of brake operation, which may occur under certain conditions, are explained as causes of the instability.

Harding, PRJ Day, AJ (Mintex Limited) *Institution of Mechanical Engineers Proceedings* Vol. 195 HS-032 895, Dec. 1981, pp 315-323

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: Institution of Mechanical Engineers, 1 Birdcage Walk, Westminster, London SW1H 9JJ, England

366772
EFFECTS OF EXHAUST GAS RECIRCULATION ON FUEL CONSUMPTION
The effects of EGR on fuel consumption were analysed quantitatively in terms of factors improving and deteriorating fuel economy through experiment as well as thermodynamic calculations. To examine the effects of combustion duration on fuel economy under heavy EGR, experiments were performed with three engine variations. In calculation models, changes in specific heats, heat transfer rate, and dissociation rate caused by changes in gas temperature were considered. In conclusion, it may be stated that reductions of pumping loss, cooling loss, and dissociation were found to be improving factors, where the contribution ratio was approximately 4.5:4.0:-1.5. The sum of calculated fuel economy gain increased steadily as the EGR increased, and reached more than 10 percent at a 20 percent EGR under light load condition. On the other hand, a major deteriorating factor was found to be a combustion fluctuation. This combustion fluctuation could be significantly reduced by achieving a "fast burn" through increased turbulence and/or dual point ignition.

Nakajima, Y Sugihara, K Takagi, Y Muranaka, S (Nissan Motor Company Limited) *Institution of Mechanical Engineers Proceedings* Vol. 195 HS-032 896, Dec. 1981, pp 369-376, Refs.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: Institution of Mechanical Engineers, 1 Birdcage Walk, Westminster, London SW1H 9JJ, England

366773
STUDIES ON A UNIT INJECTION FOR CARS WITH HIGH-SPEED ENGINES
The development of modern diesel engines is moving towards increased power per unit of displacement, lower engine weight, wider speed range, better fuel economy and lower noise and pollution levels. Due to these trends Friedmann and Maier have developed a new injection system, the unit injector. This paper deals with the development of the unit injector, its special features and its advantages and disadvantages in comparison with conventional in-line pumps.

Herzog, P (Friedmann and Maier AG, Austria) *Institution of Mechanical Engineers Proceedings* Vol. 195 HS-032 897, Dec. 1981, pp 389-395, Refs.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: Institution of Mechanical Engineers, 1 Birdcage Walk, Westminster, London SW1H 9JJ, England

366774
HIGHWAY ACCIDENT REPORTS--SUMMARY FORMAT--ISSUE NUMBER 2--1980
The highway field activity for the second half of Fiscal 1980 included 28 highway accident investigations. This document contains summary reports and statements of probable cause of 24 of these reports and of 4 from the first half of FY 1980. The criteria for selection of accidents for investigation were accident severity (5 or more fatalities), technical problems with a national implication and public interest. The summary reports briefly state the facts and circumstances of each accident, a brief analysis of the facts and the probable cause developed through the analysis. These summary reports are for use in providing a Safety Board approved statement of probable cause in the public docket. As reported they have no statistical significance.

National Transportation Safety Board NTSB-HAB-81-1, HS-032 898, Nov. 1981, 120p

For more detailed information concerning any individual report, the reader may review the complete reference file in the Public Inquiries Section, National Transportation Safety Board, 800 Independence Avenue, S. W., Washington, D.C. 20594.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: NTIS PB82-139379

366775

HOW GM'S THROTTLE BODY FUEL-INJECTION SYSTEM WORKS

General Motors is equiping a large number of its 1982 model-year cars with a Throttle Body Injection (TBI) fuel system described as an electronic injector fuel-metering system. According to the company, the TBI system will lower exhaust emissions, improve gas mileage, return some performance punch, improve cold starting and running, and eliminate flat spots in acceleration.

Yates, T *Popular Mechanics* Vol. 155 No. 2, HS-032 899, Feb. 1982, 2p

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: Hearst Magazines, 224 West 57th Street, New York, New York, 10019

366776

TROUBLESHOOTING GM'S 5.7-LITER DIESEL V8. PART I

Practically all diesel-powered GM cars and light trucks use the Oldsmobile-made 5.7-liter (350-cu.-in.) V8 engine. In terms of numbers it is the most popular diesel engine in the United States and it is discussed thoroughly in this article. The article then goes on to discuss the three main reasons why this diesel engine won't start or keep running in cold weather: (1) Diesel fuel thickens (develops paraffin, a waxy substance that blocks fuel flow to the engine); (2) Insufficient cranking speed, because engine oil thickens; and (3) Glow-plug failure.

Schultz, M *Popular Mechanics* Vol. 157 No. 1, HS-032 900, Jan. 1982, pp 37-40

This is the first of a two-part article. The second part is published in Popular Mechanics, February 1982, V157 N2, HS-032 913.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: Hearst Magazines, 224 West 57th Street, New York, New York, 10019

366777

WHY DRIVING RECORDS DO NOT REFLECT HOW WELL YOU DRIVE

A countrywide survey, sponsored by the All-Industry Research Advisory Council (AIRAC), examined state motor vehicle records to determine the adequacy of these official records to provide information on a motorist's driving performance. It was found that these driving records contained on the average less than one-third of the auto accidents which had been reported to auto insurers. In general, accidents involving collision coverage cases appeared less frequently than those involving property damage liability coverage. This article discusses further the results of the AIRAC survey and enumerates the flaws found to exist in the current accident-reporting system. It was concluded that because complete and accurate driving records are so important (e.g., they are used for review and renewal of drivers' licenses, among other things), legislatures need to examine the reasons why the accident-reporting system is not up to par in their states.

Journal of American Insurance Vol. 57 No. 2, HS-032 901, 1981, pp 1-5

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: University Microfilms International, 300 North Zeeb Road, Ann Arbor, Michigan, 48106

366778

THE EFFECTS OF MODERATE LEVELS OF ALCOHOL AND MARIHUANA, ALONE AND IN COMBINATION ON CLOSED-COURSE DRIVING PERFORMANCE

The experiment reported herein examined the ability of eight, male drivers to perform a series of closed-course driving tasks under the influence of moderate levels of alcohol and marihuana, either alone or in combination. Data were obtained, using a computer-based, in-car, data acquisition system, on driving tasks that were representative of typical driving situations. Analyses of the driving performance data suggested that both drugs, either alone or in combination, adversely affected driving performance, but not to the extent that the effects were observable without the assistance of sophisticated data collection equipment. Univariate analyses of individual performance measures indicated that several measures varied significantly among drug treatments between each drug condition. Multivariate analyses, on the other hand, were generally able to isolate performance on one drug treatment from that on any other. The results are discussed in terms of the development of an on-line monitoring device that would be able to detect an impairment in driving behaviour.

Attwood, DA Williams, RD Bowser, JS (Department of Transport, Canada) McBurney, LJ (Defence and Civil Inst of Environmental Med, Can) Frecker, RC (Toronto University, Canada)
Defence and Civil Inst of Environmental Med, Can 81-RSU-17, HS-032 902, May 1981, 27p, Figs., Tabs., Refs.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: Defence and Civil Inst of Environmental Med, Can, 1133 Sheppard Avenue West, P.O. Box 2000, Downsview, Ontario M3M 3B9, Canada

366779

FRONT-WHEEL DRIVE CARS COULD BRING NEW TIRE TECHNOLOGY

In this interview, F. Kovac, vice president of tire development for Goodyear says that the increasing use of front-wheel drive has prompted tire engineers to consider the need for different rear and front tires. In studying this possibility, Goodyear engineers will monitor performance of Eagle NCT street radials this year on front-wheel drive racing sedans in the International Motor Sports Association's Champion Spark Plug Challenge Road Racing Series, where many thousands of miles of highway wear and tear can be compressed into a few hundred miles of high-speed competition.

Hawk, D *NTDRA Dealer News* Vol. 45 No. 2, HS-032 903, Feb. 1982, 2p

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: National Tire Dealers and Retreaders Association, 1343 L Street, NW, Washington, D.C., 20005

366780

82 GM-STYLE REAR COMPARTMENT GLASS. INSTALLATION/ASSEMBLY DETAILS FROM CADILLAC SERVICE MANUAL

Detailed instructions for installation of the rear lift window on certain 1982 GM body styles are given. These instructions are taken directly from the service manual for Cimarron Cadillac but are applicable to similar cars from other GM divisions.

Glass Dealer Vol. 32 No. 2, HS-032 904, Feb. 1982, 11 p This is the first in a new monthly series of illustrated instructions on various auto glass replacements.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: National Glass Dealers Association, 1000 Connecticut Avenue, NW, Washington, D.C., 20036

366781

TRAILER BRAKES--HOW THEY WORK

The condition and capacity of trailer brakes have taken an ever-increasing importance with the downsizing of tow-vehicles in the last few years, added to the fact that high gasoline prices have subjected many trailers to longer periods of dry storage, which can, of course, affect trailer brake performance through deterioration. This article explains in detail how to properly hook up, adjust and maintain electric brakes, and reviews briefly surge and vacuum/hydraulic brakes.

Mater, RK *Trailer Life* Vol. 42 No. 3, HS-032 905, Mar. 1982, 5p

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: Trailer Life Publishing Company Incorporated, 23945 Craftsman Road, Calabasas, California, 92132

366782

COMPILATION OF INSPECTION/MAINTENANCE FACTS AND FIGURES

Since the passage of the 1977 Amendments to the Clean Air Act, a great deal of information has been assembled about vehicle inspection and maintenance (I/M) programs. Laboratory studies, surveys, and investigations of operating I/M programs have been conducted to quantify the costs and benefits and to project the impact of these programs on air quality. This report compiles and summarizes the latest technical information available from these studies for the use of policy makers and planners. The facts and figures in this report have been gathered from the technical reports referenced at the end of the document. Interested readers are encouraged to obtain these reports for additional information.

Armstrong, J Tierney, E
Environmental Protection Agency EPA-AA-IMS/81-15, HS-032 906, June 1981, 18p

Acknowledgment: National Highway Traffic Safety Administration
Order From: NTIS PB82-112400

366783
STRUCTURAL-ACOUSTIC FINITE ELEMENT ANALYSIS OF THE AUTOMOBILE PASSENGER COMPARTMENT: A REVIEW OF CURRENT PRACTICE

This paper contains a brief review of the formulation of the finite element method for structural-acoustic analysis of an enclosed cavity, and illustrations are given of the application of this analytical method at General Motors Corporation to investigate the acoustics of the automobile passenger compartment. Low frequency noise in the passenger compartment (in approximately the 20-200 Hz frequency range) is of primary interest, and particularly that noise which is generated by the structural vibration of the wall panels of the compartment. The topics which are covered in the paper include the computation of acoustic modes and resonant frequencies of the passenger compartment, the effect of flexible wall panels on the cavity acoustics, the methods of direct and modal coupling of the structural and acoustic vehicle systems, and forced vibration analysis illustrating the techniques for computing panel-excited noise and for identifying critical panels around the passenger compartment. The capabilities of the finite element method are illustrated by application to the production automobile, and experimental verifications of the various techniques are presented to illustrate the accuracy of the method.

Nefske, DJ Wolf, JA, Jr Howell, LJ (General Motors Research Laboratories) *Journal of Sound and Vibration* Vol. 80 No. 2, HS-032 908, Jan. 1982, pp 247-266, Figs., 1 Tab., 34 Ref.

Acknowledgment: National Highway Traffic Safety Administration
Order From: ESL

366784
REGULARITY OF TRAFFIC NOISE SIGNALS

The flexibility of the filtered renewal process compared with the filtered Poisson process as a model for traffic noise is demonstrated. This is done by proving that for the family of gamma distributed headways with coefficient of variation less than one the variance of the traffic noise signal never exceeds that of the corresponding filtered Poisson process. Furthermore it is proved that the inverse inequality holds for the family of completely monotone distributions, which includes all finite mixtures of exponential distributions. The theory is illustrated by some numerical calculations.

Andersen, PK (Danish Medical and Social Science Res Councils) *Journal of Sound and Vibration* Vol. 80 No. 2, HS-032 909, Jan. 1982, pp 267-274, 1 Fig., 25 Ref.

Acknowledgment: National Highway Traffic Safety Administration
Order From: ESL

366785
THE EFFECTIVENESS OF DEFERRED PROSECUTION FOR DRIVING WHILE INTOXICATED OFFENDERS

Washington State's Deferred Prosecution Law permits certain defendants to have a misdemeanor charge dismissed if the defendant successfully participates for two years in a treatment program for alcohol, drug, or mental problems. The law has been extensively applied in Driving While Intoxicated (DWI) cases. This study was designed to assess post-deferral driving performance for a sample of DWI offenders who participated in Deferred Prosecution as compared to a Control group of nondeferred DWI offenders. It was found that the Deferred group had significantly more post-deferral alcohol-related traffic violations than did the Control group. The findings indicate that the major objective of the law has not been accomplished.

Salzberg, PM Klingberg, CL (Washington State Department of Licensing) *AAAM Quarterly/Journal* Vol. 4 No. 1, HS-032 910, Jan. 1982, pp 35-41

Acknowledgment: National Highway Traffic Safety Administration
Order From: American Association for Automotive Medicine, P.O. Box 222, Morton Grove, Illinois, 60053

366786
MAKING JUST-IN-TIME PRODUCTION PAY OFF

Two types of management techniques are compared: the "Conventional Supply Principle," in use by the U.S. auto industry, and the "Just-in-Time," or "Kanban Procedure Principle "(the Kanban System is a subsystem that refines just-in-time to the nth degree), used by the Japanese auto industry. It is concluded that with just-in-time production, the U.S. auto industry could save $2.1 billion a year and so provide badly needed dollars for working capital. Some examples of just-in-time production in the U.S. are given.

McElroy, J *Automotive Industries* Vol. 162 No. 2, HS-032 911, Feb. 1982, pp 77-80

Acknowledgment: National Highway Traffic Safety Administration
Order From: ESL

366787
HEAT EXCHANGERS AIM AT HIGHER PERFORMANCE

This brief article discusses the various features of aluminum versus copper-brass radiators in light of the fact that today's lighter, smaller cars need lighter, smaller, high performance radiators. The cost effectiveness of different production methods is also examined.

Mullins, PJ *Automotive Industries* Vol. 162 No. 2, HS-032 912, Feb. 1982, pp 74-75

Acknowledgment: National Highway Traffic Safety Administration
Order From: ESL

366788
WINTER-PROOFING YOUR 5.7-LITER GM DIESEL ENGINE. PART II

This is the second instalment of a two-part article focusing on the GM 5.7-liter (350-cu-in) diesel engine. This article explains how to avoid no-starts that are caused by engine-oil thickening and glow-plug failure. A list of six helpful starting tips is included.

Schultz, M *Popular Mechanics* Vol. 157 No. 2, HS-032 913, Feb. 1982, pp 35-38

For Part 1 see Popular Mechanics V157 N1, January 1982 HS-032 900.

Acknowledgment: National Highway Traffic Safety Administration
Order From: Hearst Magazines, 224 West 57th Street, New York, New York, 10019

366789
SOPHISTICATED AUTO SOUND. SHOULD YOU TACKLE A SUPERSYSTEM?

Procedures to design and install a stereo system are given. Several inserts are included: "Getting wired"; "Tools of the trade"; "The 200 SX System"; 10 Common beginner's blunders"; and "Building a better box".

Nagy, B *Motor Trend* Vol. 34 No. 3, HS-032 915, Mar. 1982, pp 79-82

Acknowledgment: National Highway Traffic Safety Administration
Order From: Petersen Publishing Company, 8490 Sunset Boulevard, Los Angeles, California, 90069

366790
DEALING WITH ALCOHOL OFFENSES IN TRAFFIC WITH SPECIAL CONSIDERATION OF EFFORTS IN AFTER-WORK TRAFFIC

This report presents the findings from an effort to control traffic offenses connected with alcohol in the city of Ludwigshafen am Rheim. It was found that the optimum control of drunk driving violations assumes: (a) steady collection of information on attempts or actions on the part of potential alcohol violators to avoid targeted police measures; (b) control measures set up considering critical times and places; (c) producing area pressure by "flying" alcohol checks in organized form as well as during routine patrol duty; (d) motivation of personnel by using action concepts which have been successfully tested in practice; (e) exhaustive use of all legal possibilities which are made available by the legislature; and (f) publication of police activities and successes.

Falk, J (Police Commissoner, Ludwigshafen/Rhein, W Ger) *Polizei Technik Verkehr* HS-032 916, Jan. 1981, pp 7-10
English translation available as reference copy only.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: Verlagsgesellschaft mbH und Co, KG, Juliusstrasse 2, Postfach 19, 6200 Wiesbaden, West Germany

366791

ON THE ADMISSIBILITY OF LEGAL MEASURES AGAINST INTOXICATED DRIVERS

This article discusses a court case in Baden-Wuerttemberg in which the Administrative Court declared illegal the police confiscation and towing of the vehicle of a driver incapacitated by alcohol. The circumstances, reasons for the decision, and the individual case ruling are presented, followed by a critique and an explanation of statutory police practice.

Greiner, A (Police Chief, Karlsruhe-Durlach, West Germany) *Polizei Technik Verkehr* HS-032 917, Oct. 1979, 2p
English translation available as reference copy only.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: Verlagsgesellschaft mbH und Co, KG, Juliusstrasse 2, Postfach 19, 6200 Wiesbaden 1, West Germany

366792

ON THE ADMISSIBILITY OF TAKING A SECOND BLOOD SAMPLE IN CASES OF TRAFFIC OFFENSES

In all federal states of the Federal Republic of Germany and in the federal state of Berlin, the materially identical ordinances/orders as to the detection of alcohol in blood in criminal offenses and violations of order were revised in 1977-1978. The statements as to the admissibility of ordering a second blood sample differ considerably from the previous versions. This fact has raised a number of questions in police practice which occasionally reveal a certain uncertainty as to the law. The authors are concerned with the question, which is so important for police traffic surveillance, of the extent to which the taking of a second blood sample is permissbile according to the current legal decrees in traffic offenses.

Greiner, A (Police Chief, Karlsruhe-Durlach, West Germany) Rettig, H (State-Police School, Baden-Wuerttemberg, W Ger) *Die Polizei* HS-032 918, Aug. 1979, pp 258-261
English translation available as reference copy only.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: Heymanns (Carl) Verlag KG, Gereonstrasse 18-32, 5000 Cologne 1, West Germany

366793

NEW PROCEDURES FOR THE DETECTION OF NARCOTICS

This article discusses detection procedures for narcotic intake in order to judge fitness for driving. It also addresses the alcohol detection process for judging fitness to drive, relating breath alcohol measurement with the determination of blood alcohol concentration. The present search for devices which can be used for immediate, direct detectability of narcotics and/or alcohol at the "scene of the crime" is discussed, and two devices undergoing trial tests for alcohol detection are described. It is stated that detecting devices for drugs and medicines will probably depend upon their qualitative detection using saliva.

Brackemeyer, U (Res and Dev Agency for Police Engineering, W Ger) *Die Polizei* HS-032 919, May 1978, pp 140-142
English translation available as reference copy only.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: Heymanns (Carl) Verlag KG, Gereonstrasse 18-32, 5000 Cologne 1, West Germany

366794

ALCOTEST 7010. AN INFRARED MEASURING DEVICE FOR DETERMINING THE BLOOD ALCOHOL CONCENTRATION BY MEASURING THE BREATH ALCOHOL CONCENTRATION

Alcotest 7010 serves to rapidly and precisely determine the level of influence of alcohol. It measures the alcohol concentration in expired deep lung air by determining the infrared absorption at a wavelength of 3.4 micrometers, computes the blood alcohol concentration and displays this figure digitally in parts per thousand. Hard copy of the measurement results for the preservation of evidence is possible using the built-in printer. Alcotest 7010 is intended for use at police stations and in patrol cars. User-convenience was considered especially important: when the device is ready for operation, a fully automatic measurement cycle is started by pressing a single push-button. A particular advantage of the infrared measurement process used is the excellent short-and long-term reproducibility of the measurement results. The high accuracy reduces the number of false positive indications in the critical area of 0.8 per thousand to a minimum. The digital readout of results simplifies the evaluation of the test for the officers. To avoid reading errors the results can also be printed out. Alcotest 7010 cannot be manipulated. A measurement is only recorded when the person under test has breathed deep lung air into the sensor. This sampling condition is fulfilled in that the person under test must blow into the Alcotest 7010 continuously for a specific period of time with a minimum flow of air. If the person under test attempts to manipulate the results using special breathing techniques, the measurement cycle is automatically interrupted.

Grambow, L Kempin, F (German Patent Office) *Polizei Technik Verkehr* HS-032 920, July 1980, pp 293-298
English translation available as reference copy only.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: Verlagsgesellschaft mbH and Co, KG, Juliusstrasse 2, Postfach 19, 6200 Wiesbaden, West Germany

366795

DRUNK DRIVING IN TRAFFIC

In 1973/1974 a survey was made in the Federal Republic of Germany to estimate the proportion of drunk car drivers in traffic. 13.85% of drivers responded that they had operated the vehicle they most frequently used at least once in the course of the second half of 1973 under considerable influence of alcohol and therefore had to worry about coming up against a police check. Further results of this survey are discussed in this article and hypotheses are developed on road use by drunk drivers by time of day.

Zelinka, FF *Polizei Technik Verkehr* HS-032 921, Dec. 1978, pp 521-523
English translation available as reference copy only.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: Verlagsgesellschaft mbH und Co, KG, Juliusstrasse 2, Postfach 19, 6200 Wiesbaden 1, West Germany

366796

HYBRID AUTOMOBILES: COSTS VS. POTENTIALS

This article presents the findings by five research organizations who conducted studies during 1977-1980 to determine the near-term tradeoffs between hybrid electric passenger cars and their internal combustion engined counterparts. It was found that: heat engine/electric hybrid vehicles have a potential for subsituting electrical energy for 40-80% of the petroleum fuel consumed by conventional internal combustion engine cars; hybrids exceed their counterparts' projected purchase prices by 21-62%, but run only 0-27% more in terms of life-cycle costs; and hybrids' cost competitiveness is inversely correlated with their petroleum fuel displacement capabilities and quite sensitive to petroleum fuel prices. All the selected designs achieved break-even life-cycle costs at fuel prices of $2.70/gallon or less in 1978 dollars.

Automotive Engineering Vol. 90 No. 2, HS-032 922, Feb. 1982, pp 63-68

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: ESL

366797

ELECTRONS AGAINST AUTO THEFT. HOW THE COPS AND THE FBI CATCH CAR THIEVES COAST TO COAST

Computers are the new tools in the battle against auto theft. This article reviews different types of data files and electronic systems, from the in-car computer terminal that links the local policemen to a main computer, to the gigantic computer installation in Washington, D.C. where vehicle theft reports are stored on a national basis, the National Crime Information Computer (NCIC). Stolen cars are entered in the computer by VIN (vehicle identification number) and descriptive data. The insurance industry supports an electronic computer system and investigative arm of its own, the North American Theft Information System (NATIS) operated by the National Auto Theft Bureau (NATB) and police investigators can obtain information on suspect vehicles from a NATIS operator. Every year since about 1960, car manufacturers have shipped to NATIS magnetic tapes bearing all new VINs in production. Finally, in 1980 the Federal Vehicle Identification Standard was implemented, providing for a 17 character, standard format

VIN for all vehicles sold in this country, and this number is "built" to to aid police and insurance investigators in identifying stolen vehicles with computers.

Ross, DC *AutoWeek* Vol. 32 No. 9, HS-032 923, Mar. 1982, 1p

Acknowledgment: National Highway Traffic Safety Administration
Order From: Crain Consumer Group, 13920 Mount McClellan Avenue, Reno, Nevada, 89506

366798

AUTOS, ALCOHOL, AND ADOLESCENCE: FORGOTTEN CONCERNS AND OVERLOOKED LINKAGES

Research, education and prevention efforts dealing with adolescent alcohol use and traffic safety have been focused almost exclusively upon the phenomenon of drinking and driving. Such focus has unfortunately led to a general disregard of other equally important behaviors related to alcohol and automobile use. Of particular concern in this paper is the existence of a group of adolescents who ride with a drinking driver but do not drink and drive themselves. In an attempt to socially locate and better understand this segment of the population, we compare this group to those who both drink and drive and ride with a drinking driver, and those who do neither. Specific attention is given to selected socio-demographic characteristics and alcohol related attitudes and behaviors as group discriminating factors. In addition, the findings suggest that the practice of riding with a drinking driver may be causally linked to the eventual practice of drinking and driving.

Nusbaumer, MR (Indiana University-Purdue University, Fort Wayne) Zusman, ME (Indiana University Northwest) *Journal of Drug Education* Vol. 11 No. 2, HS-032 924, 1981, pp 167-178

Acknowledgment: National Highway Traffic Safety Administration
Order From: Baywood Publishing Company Incorporated, 120 Marine Street, Farmingdale, New York, 11735

366799

LAP SEAT BELTS USEFUL BUT CAN INJURE CHILDREN

In discussing the issue of seat belt use, this article specifically points out the "seat belt syndrome". According to Kamal N. Ibrahim, M.D. and assistant professor of orthopedic surgery at Loyola University of Chicago's School of Medicine, "There is no doubt that the automobile lap seat belt is an effective means of reducing fatalities from car accidents. However, the lap belt focuses the collision forces on the pelvis and lower part of the torso producing abdominal and lumbar injuries." Seven patients with such injuries who were back seat passengers, wearing lap belts, in cars involved in head-on collisions at estimated speeds of 40 to 50 mph were treated by Ibrahim and colleagues between 1977 (when Ontario's compulsory seat belt law went into effect) and 1979 at the Hospital for Sick Children, Toronto. Further discussion of these seven patients is included in this article and the question is raised as to whether or not shoulder harnesses should be installed in the back seats of automobiles.

American Medical Association, Journal of Vol. 245 No. 22, HS-032 925, June 1981, 2p

Acknowledgment: National Highway Traffic Safety Administration
Order From: Technical Publishing Company, 535 North Dearborn Street, Chicago, Illinois, 60610

366800

PATTERNS OF TEENAGED DRIVER INVOLVEMENT IN FATAL MOTOR VEHICLE CRASHES: IMPLICATIONS FOR POLICY CHOICE

The failure (sometimes with harmful effects) of many current public policies to reduce fatal motor vehicle crashes of teenaged drivers points up the need to consider a broader range of policy options. This article examines data on 236,205 drivers in fatal crashes, including 19,470 who were less than eighteen years old, for patterns which might suggest or rule out particular options. Adults are seldom in the vehicle when drivers under eighteen crash, but requiring the presence of an adult might increase adult deaths rather than reduce teenage crashes. Identification of risk groups through crash and violation records cannot be very effective because drivers under eithteen in fatal crashes usually have no prior record. Legal precedent regarding minors and the pattern of fatal crash involvement by licensure status and time of day suggest that raising the age of licensure to eighteen or prohibiting driving from 8 p.m. to 4 a.m. by drivers under eighteen would reduce deaths substantially. Since only 52 percent of motorcyclists under eighteen had a valid motorcyclist license, increased enforcement of motorcyclist licensure laws has the potential to reduce motorcyclists' deaths even if present licensing ages are retained.

Robertson, LS (Yale University) *Journal of Health Politics, Policy and Law* Vol. 6 No. 2, HS-032 926, 1981, pp 303-314, 4 Fig., 1 Tab., 20 Ref.

Acknowledgment: National Highway Traffic Safety Administration
Order From: Duke University, Department of Health Administration, Durham, North Carolina, 27706

366801

THE USE OF INFANTS' ANS CHILDRENS' OCCUPANT SAFETY DEVICES IN MOTOR VEHICLES: AN OBSERVATIONAL STUDY

A study of the use of automotive protective restraint systems carried out in urban Oahu demonstrates alarmingly low levels of use by infants and young children, as well as by drivers. Overall, infants and children through the age of 10 years were unprotected 93% of the time. Drivers were unprotected at least 90% of the time. Physicians and other health professionals are called upon to aid in intervention programs to increase the usage of occupant protective devices in order to eliminate this major cause of deaths and injuries to infants and young children.

Smith, RG (Hawaii University) Berkline, RR *Hawaii Medical Journal* Vol. 39 No. 11, HS-032 927, Nov. 1980, pp 283-285, 3 Tab., 8 Ref.

Acknowledgment: National Highway Traffic Safety Administration
Order From: Hawaii Medical Association, 320 Ward Avenue, Honolulu, Hawaii, 96814

366802

CHILD SAFETY PROGRAMS: IMPLICATIONS AFFECTING USE OF CHILD RESTRAINTS

Automobile deaths have been identified as the leading cause of death for children between the ages of one and fourteen. Those children who are unrestrained as passengers are at particularly high risk to injury and death. School health and safety programs need to include an understanding of this problem and implement efforts to increase restraint usage. A study of parental seatbelt and child passenger restraint use was conducted to identify frequency of use and behavioral and attitudinal factors influencing use of child restraints. Self-reported data of drivers seatbelt use at all times was 19.0%, and the use of a child restraining device was 49.6%. Data recorded in a previous observational study noted a driver seatbelt usage rate of 14.2% and use of a child restraining device at 25.6%. Major reasons for non-use of seatbelts by drivers included discomfort and restricted movement. Reasons for non-use of child restraints focused upon the dislike and discomfort of the child for the restraint.

Hoadley, MR Macrina, DM Peterson, FL *Journal of School Health* Vol. 5 No. 5, HS-032 928, May 1981, pp 352-355

Acknowledgment: National Highway Traffic Safety Administration
Order From: University Microfilms International, 300 North Zeeb Road, Ann Arbor, Michigan, 48106

366803

FATAL MOTOR VEHICLE ACCIDENTS OF CHILD PASSENGERS FROM BIRTH THROUGH 4 YEARS OF AGE IN WASHINGTON STATE

During the decade beginning Jan.1, 1970 and ending Dec. 31, 1979, approximately 39,500 child passengers aged 0 to 4 years were in motor vehicle accidents reported and investigated in the State of Washington; 148 (0.4%) of the children were killed outright or subsequently died. Of the 39,500 children, approximately 6,300, or 16%, were wearing some type of safety restraint and only two, or 1:3,150, were killed. On the other hand, 33,200 were not wearing restraints and 146, or 1:227, were killed. If these ratios are extrapolated, one might conclude that if all the children had been wearing restraints, there would have been 93% fewer deaths. A detailed analysis was performed on 39 fatalities for the years 1977, 1978, and 1979. Fatal accidents involving young children in Washington State usually occurred under ordinary circumstances on dry roads at low speeds during daylight hours and were unrelated to alcohol usage.

Scherz, RG *Pediatrics* Vol. 68 No. 4, HS-032 929, Oct. 1981, pp 572-575

Acknowledgment: National Highway Traffic Safety Administration
Order From: University Microfilms International, 300 North Zeeb Road, Ann Arbor, Michigan, 48106

366804

VISUAL ACUITY IN A CONDITION OF TRAFFIC SIGN VIEWING: THE EFFECTS OF LUMINANCE CHANGES

Landolt C visual acuity of eight subjects was measured as a function of stimulus luminance. To simulate traffic sign viewing, a stimulus field width of 0.7 degree with a surround field of 60 degrees was used. The surround luminance was changed in steps of a factor of 10 from 0.5 to about 5000 cd/sq m. Both dark symbols on a light background and light symbols on a dark background were considered. The presentation time was either unlimited or 200 msec. For surround luminances up to 5 cd/sq m, the relation between acuity and stimulus luminance can be described by a function of the same shape. For all surround luminances higher than 50 cd/sq m a second function is needed. In all conditions with long presentation times, the results were identical for light symbols on a dark background and dark symbols on a light background. With a stimulus time of 200 msec the acuity is, on the average, 0.7 times the acuity with long presentation time.

Van Norren, D *American Journal of Optometry & Physiological Opts* Vol. 58 No. 9, HS-032 930, Sept. 1981, pp 699-705

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: American Academy of Optometry, 117 W Broadway, P.O. Box 565, Owatonna, Minnesota, 55060

366805

THE OPTIMUM SPEED LIMIT. PROFESSIONAL PAPER 312

In setting the speed limit, the government should consider only externalities, e.g., the tendency of one driver's speed to endanger other drivers. In this paper, we discuss the methodology for estimating the optimal speed limit, based on externalities. We carry out a numerical illustration to demonstrate how the methodology leads to (1) a numerical estimate of the optimum speed limit, (2) an estimate of the dollar loss from a suboptimum speed limit, (3) an estimate of cost per life saved, and (4) the suggestion that federal traffic data collection efforts and traffic studies be redirected toward discovering two crucial parameters: the speed drivers would go if left alone and the ratio of the external to internal marginal cost of highway speed.

Jondrow, J Bowes, M Levy, R
Public Research Institute HS-032 932, May 1981, 21p, 12 Ref.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: NTIS AD-A100425

366806

RAISING THE LEGAL DRINKING AGE IN MICHIGAN AND MAINE

Previous research has shown that increased alcohol availability associated with reductions in legal minimum age for purchase of alcoholic beverages resulted in increased alcohol-related traffic crash involvement among young drivers. In the late 1970s, Michigan raised the drinking age from 18 to 21, and Maine from 18 to 20, providing natural experiments reducing alcohol availability. Effects of the raised drinking age on motor vehicle crash involvement were evaluated using a tri-level hierarchical multiple time-series design. Results revealed a significant 20% reduction in alcohol-related injury-producing crash involvement among 18-20-year-old Michigan drivers directly attributable to the higher drinking age; alcohol-related property damage crashes decreased 17% for this age group. Maine drivers age 18-19 experienced a 20% reduction in alcohol-related property damage crash involvement attributable to the raised drinking age. It is concluded that the legal minimum drinking age has a significant effect on alcohol-related motor vehicle crash involvement among young drivers. Implications of the findings for beverage alcohol availability theory and public policy concerning the prevention of alcohol-related problems are included.

Wagenaar, AC Douglass, RL Compton, CP Pettis, LC
Highway Safety Research Institute, National Institute on Alcohol Abuse Final Rpt. UM-HSRI-81-58, HS-032 940, Dec. 1981, 367p
Contract H84 AA 04794-01

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: Highway Safety Research Institute, Huron Parkway and Baxter Road, Ann Arbor, Michigan, 48109

366807

CHILDREN KILLED IN FALLS FROM MOTOR VEHICLES

In 1978 in the United States, 38 children aged 5 years or younger were killed when they fell from the passenger compartments of moving motor vehicles not involved in crashes. Twenty-eight children (74%) were boys. Eighteen (47%) were 2 years old; 35 (92%) were aged 1 to 3 years. Thirty-six children fell out through doors, one fell out of a window, and one fell through a hole in the floor. Sixteen falls occurred when the driver was making a turn or going around a curve, nine when someone opened the door, seven when the driver was proceeding straight ahead, five when the driver was backing out of a driveway, and one when the driver was swerving. All 38 children killed in falls from vehicles were unrestrained. Use of seat belts or child restraint systems would prevent falls even if doors came open, as well as providing protection in crashes. A recent study has shown that pediatricians, by routinely counseling parents to restrain children in cars, can have some effect in increasing child restraint use. Pediatricians should also encourage parents to transport children in rear seats and to check at the start of trips to ensure that all doors are completely closed and locked.

Williams, AF *Pediatrics* Vol. 68 No. 4, HS-032 941, Oct. 1981, pp 576-578, Refs.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: University Microfilms International, 300 North Zeeb Road, Ann Arbor, Michigan, 48106

366808

SIMULATORS CAN BE ADAPTED TO TRAIN DEAF DRIVERS

Stating that deaf drivers have fewer accidents than hearing drivers even though deaf drivers tend to use their vehicles more than hearing drivers, this article addresses the topic of driver education for hearing-impaired students. Results are reported from tests conducted on various ways to adapt standard simulator films so they can be used by both deaf and hard-of-hearing students.

Sendelbaugh, JW (Northern Illinois University) *Traffic Safety* Vol. 81 No. 6, HS-032 942, Dec. 1981, 4p

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: University Microfilms International, 300 North Zeeb Road, Ann Arbor, Michigan, 48106

366809

EURPOREAN ECONOMIC COMMUNITY SUPPORT FOR MAJOR BIOMECHANICS RESEARCH PROGRAMME

The article describes the ongoing impact biomechanics research programme currently being supported by the Commission of the European Communities. The six principal research themes are listed, as is the background history and the reasoning leading up to the start of the programme in late 1978. The projects are briefly described, in terms of gaps in knowledge detected, research methodology, and expected results.

Aldman, B (Chalmers University of Technology, Sweden) Benjamin, TEA (Organisme National de Securite Routiere) *AAAM Quarterly/Journal* Vol. 4 No. 1, HS-032 943, Jan. 1982, pp 31-34

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: American Association for Automotive Medicine, P.O. Box 222, Morton Grove, Illinois, 60053

366810

BE A SAFE HOME MECHANIC

This article discusses safety practices which should be exercised by the home mechanic. Some suggestions made are: wear snug fitting clothes; keep the engine off unless it needs to be on; let the car cool off before working on it to avoid burns; never take the top off of a hot radiator; never crawl under a car supported solely by a jack; never smoke around gasoline or the car's engine; use non-flammable cleaners; and have a fire extinguisher available. Other suggestions are made along with many helpful tips, such as what to use in place of jacks to raise the front end of the car.

Bauman, R *California Highway Patrolman* Vol. 45 No. 11, HS-032 944, Nov. 1982, 4p

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: California Association of Highway Patrolmen, P.O. Box 2631, Sacramento, California, 95812

366811

TOWARD THE DEVELOPMENT OF A COMPREHENSIVE DRIVING TEST: LOW-SPEED MANEUVERING

The purpose of this study was to develop a battery of low-speed driving tests that could be used for preliminary screening of drivers, vehicles, and components. A number of driving tests were developed, together with suitable performance measures. These were administered to a group of 26 subjects, and the data subjected to a factor analysis. Six factors emerged from the analysis, with one or more tests under each. The results indicate that a test battery can be created using a small number of tests, in a relatively confined space, and without elaborate instrumentation, and still sample a number of relevant driving skill dimensions.

Olson, PL Butler, BP Burgess, WT Sivak, M
Highway Safety Research Institute, National Institute of Handicapped Research UM-HSRI-82-4, HS-032 946, Feb. 1982, 32p
Contract 23-P-5922115-03/04

Acknowledgment: National Highway Traffic Safety Administration
Order From: Highway Safety Research Institute, Huron Parkway and Baxter Road, Ann Arbor, Michigan, 48109

366812
ANALYSIS OF AUTOMOBILE NO FAULT STATUTES

The material contained in this publication is an attempt to analyze only "Pure No Fault Statutes", that is, those statutes which restrict or limit the right to recover for "pain and suffering". Additional jurisdictions have purported "No Fault Statutes", but these statutes do not restrict or limit the right to recover for pain and suffering. The Federal "Omnibus Reconciliation Act of 1980" amended Section 1862 (b) of the Social Security Act. This amendment, effective December 5, 1980, indicates that Medicare is to be excess where payment for Health Care Services can be made under automobile liability or No Fault Insurance. This has created a conflict with the language of many of the State No Fault Acts.

GAB Services Incorporated HS-032 947, Aug. 1981, 33p

Acknowledgment: National Highway Traffic Safety Administration
Order From: GAB Services Incorporated, 123 Williams Street, New York, New York, 10038

366813
PSYCHOMOTOR PERFORMANCE AND REAL DRIVING PERFORMANCE OF OUTPATIENTS RECEIVING DIAZEPAM

The primary aim of this study was to compare task performance in a laboratory test and real driving performance of outpatients receiving diazepam medication with those of control subjects. Plasma and saliva samples were taken to investigate a level-response relationship. Real driving performance was measured by trained observers. The design of the laboratory test was based on a vigilance task (high attention) directly followed by a simple eye-hand coordination task (low attention). Twenty-two males participated in the study. Diazepam was given orally by prescription, mostly as a maintenance dose of 5 mg three times a day. Patients receiving diazepam showed impaired performance in the driving test and the low-attention task. Furthermore, the results indicate no relationship between plasma or saliva levels of diazepam and/or its metabolite N-desmethyldiazepam and real driving performance and/or laboratory task performance.

de Gier, JJ 't Hart, BJ Nelemans, FA Bergman, H (State University Utrecht, Netherlands) *Psychopharmacology* Vol. 73 No. 4, HS-032 948, 1981, pp 340-344

Acknowledgment: National Highway Traffic Safety Administration
Order From: Springer Verlag, 175 Fifth Avenue, New York, New York, 10010

366814
DIAZEPAM AND DRIVING ABILITY

A review of the literature indicates that neither experimental nor epidemiological studies can give a clear indication as to whether orally administered diazepam adversely affects the ability of a patient to drive a car. It is preferable for anxious, aggressive, or depressed patients not to drive. Since diazepam tends to relieve these symptoms, this particular medication should not lead to an automatic prohibition of car driving. Patients should always be urged to use great care while at the wheel of a motor car.

Landauer, AA *Medical Journal of Australia* Vol. 1 No. 12, HS-032 949, June 1981, pp 624-626

Acknowledgment: National Highway Traffic Safety Administration
Order From: Australian Medical Publishing Company, Limited, 71-79 Arundel, Glebe, Sydney, New South Wales 2037, Australia

366815
THE DETERMINATION OF SMOKE DENSITY AND OF SMOKE EVOLUTION RATE IN THE NBS CHAMBER AND THE INFLUENCE OF FLAMEPROOFING AGENTS AND SMOKE RETARDERS

A modified method for determining smoke density and smoke evolution rate in the NBS smoke chamber is proposed. The effects of mains voltage fluctuations, sample size and thickness and deposition processes on chamber walls and the optical window are taken into account. Smoke behaviour is described by the two parameters smoke intensity and smoke evolution rate. It is shown that flameproofing agents and smoke inhibitors in plastics have different effects on smoke behaviour; these effects are discussed.

Maahs, G Schuler, R (Chemische Werke Huls Aktiengesellschaft) *Journal of Fire & Flammability* Vol. 12 HS-032 952, Oct. 1981, pp 281-300, Refs.

Acknowledgment: National Highway Traffic Safety Administration
Order From: ESL

366816
OFTEN FORGOTTEN AS VIBRATION SOURCE DRIVESHAFTS YIELD PROBLEMS OR PROFIT

This article discusses the driveshaft as a possible source of vibration. It is an important link between the transmission output shaft and the differential input shaft, but is often disregarded because it can go thousands of miles without causing problems. It should be suspected as a vibration source when roughness is felt on heavy acceleration for short lengths of time, when a shudder is felt on low speed acceleration, when a whine or whistle is heard that varies with engine speed regardless of transmission gear range, when a clank is heard from the driveline at 10 mph in neutral gear, or when a fluid leak is present at the transmission end of the driveshaft. A chart is included which outlines driveshaft diagnosis procedures, and further discussion of these procedures is included in this article.

Carrier, H *Brake and Front End* Vol. 52 No. 2, HS-032 953, Feb. 1982, 6p

Acknowledgment: National Highway Traffic Safety Administration
Order From: Babcox Publications, Incorporated, 11 South Forge Street, Akron, Ohio, 44304

366817
FUEL ECONOMY RETROFIT DEVICES. ANNOUNCEMENT OF FUEL ECONOMY RETROFIT DEVICE EVALUATION

This document announces the conclusions of the EPA evaluation of the "Gastell" device under provisions of Section 511 of the Motor Vehicle Information and Cost Savings Act. On November 11, 1979, the EPA received a request from Automotive Devices, Inc. for evaluation of a fuel saving device termed "Gastell." This Device is designed to provide the vehicle operator visual and audible indications of inefficient engine operating conditions so that the fuel-conscious drivers can modify their driving habits to obtain improved efficiency. An evaluation has been made and the results are described.

Environmental Protection Agency HS-032 954, No Date, 97p, Figs., Tabs., Apps.

Acknowledgment: National Highway Traffic Safety Administration
Order From: NTIS PB81-234759

366818
ANNUAL REPORT 1979/1980. FEDERATION TO COMBAT DRUNK DRIVING

This report for the period October 1, 1979 to September 30, 1980 summarizes the accomplishments of the Federation to Combat Drunk Driving, Registered Association and non-profit organization in West Germany. The work has been performed primarily by the state sections and to a small extent by the board of the Federation. The work performed included the drafting, design, publishing, and distribution of more than 25,600 posters, 752,800 folders, 891,650 major documents and brochures, and 299,800 message presents of all types (stickers, key rings, pocket calendars, etc.). At meetings during the report period, the state sections held 39 judges' conferences with 2091 participants, 20 junior attorney training courses which 1200 people attended, 47 scientific drinking tests involving 1512 people, 2489 general educational presentations involving a total of 120,537 people, and 1226 presentations to members of the Bundeswehr (Federal Armed Forces) with 68,370 people attending. Many presentations were supplemented by films or slide shows. This report discusses these accomplishment in greater detail.

Federation To Combat Drunk Driving E.V. HS-032 955, 1980, 29p, Phots.

English translation available as reference copy only.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: Federation To Combat Drunk Driving E.V., Alsterchaussee 17, 2000 Hamburg 13, West Germany

366819

WISCONSIN MOTORCYCLE HELMET LAW: A BEFORE AND AFTER STUDY OF THE HELMET LAW REPEAL

Wisconsin motorcycle accident data three years before and three years after repeal of a mandatory helmet law were collected and analyzed in this study. Wisconsin enacted a mandatory helmet law for all motorcyle riders in 1968. The law remained in effect until it was repealed, on March 19, 1978. Prior to the repeal, in the years 1975, 1976, and 1977, virtually all riders wore helmets. During the three years after repeal (1978, 1979, 1980) helmet use was substantially reduced. The number of fatalities per 100 riders involved in accidents was used as the primary unit of measure. The "control" mechanism was the injury data for other parts of the body (arms, legs and trunk) unaffected by helmet use or nonuse. The study found that unhelmeted cyclists involved in accidents suffered head injuries at a rate of 40.64 per 100 riders, and 2.24 of every 100 unhelmeted riders died of head injuries. Of every 100 helmeted riders involved in an accident, 23.57 suffered head injuries and 1.25 died of head injuries. The rate of injury to arms, legs and trunk remained virtually constant from the three mandatory helmet years before repeal through the three years following repeal, for both helmeted and unhelmeted riders. The only increase noted was in head injuries to unhelmeted riders. Blood samples submitted by coroners showed that 47.9 percent of all fatally injured mtorcycle drivers were legally intoxicated. A total of 73 percent of the intoxicated fatal drivers were involved in single vehicle accidents with blood alcohol levels averaging over .20 percent, which is twice the legal level of intoxication in Wisconsin.

Flemming, RR (Wisconsin Department of Transportation) *Traffic Safety Newsletter* Vol. 10 No. 6, HS-032 956, Jan. 1982, pp 20-27, 5 Fig., 3 Ref.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: DOT

366820

THE IMPACT OF THE LIGHT-DUTY DIESEL ENGINE ON U.S. AIR QUALITY

This article begins with a background discussion of the growth rate of diesel automobile sales in the United States. Since the growth rate has shown and continues to show big increases, the impact of diesel emissions on the environment is viewed as a matter of growing importance. Environmental problems as reviewed in this article appear to result from particulate matter and nitrogen oxides, the two major air pollutants from diesel engines. Following a discussion of EPA regulations, this article points out current technologies for reducing diesel emissions and concludes with a look at the future impacts of light-duty vehicle dieselization.

Andersen, DA (North Dakota State University) *ITE Journal* Vol. 52 No. 3, HS-032 957, Mar. 1982, pp 20-23, 1 Fig., 1 Phot., 14 Ref.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: Institute of Transportation Engineers, 525 School Street, SW, Suite 410, Washington, D.C., 20024

366821

SIT DOWN, JUNIOR!

This brief article states that car accidents are the number one cause of death for children in the United States. It then gives six tips for safer motoring with children.

Driver Vol. 15 No. 9, HS-032 958, Feb. 1982, pp 16-17, 3 Phot.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: US Air Force Inspection and Safety Center, Norton AFB, California, 92409

366822

ON MEASURING AUTOMOBILE SEAT RIDE COMFORT

A ride number to measure the "ride comfort" of an automobile seat has been developed that could be used to numerically rank nearly all seats. In this research, ride comfort is regarded as the characteristic of the seat that isolates an occupant from annoying road vibrations. The results were obtained from a program where subjects rated a variety of different seats on a paired comparison basis. The ride number is a result of arranging the measured dynamic seat parameters in an empirical formula for the best correlation with the subjective ratings. As a result, the ride number agreed with 67% of the ratings; this compares with a 60% agreement for a ride measure based on the International Standards Organization (ISO) comfort criterion for humans. When similar seats (bucket seats) were considered, the agreement with the ride number was 80%, while with the ISO ride measure it was 65%. The ride number, being "tuned" particularly to automotive vibrations, has shown that, in general, seats need not be heavy to provide traditional ride comfort.

Varterasian, JH
General Motors Research Laboratories GMR-3679, HS-032 959, May 1981, 39p, 12 Fig., 4 Tab., 1 Phot.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: General Motors Corporation, 3044 West Grand Boulevard, Detroit, Michigan, 48202

366823

THE CONSTITUTIONALITY AND EFFECTIVENESS OF LEGISLATION REQUIRING CHILD PASSENGER RESTRAINTS

This report was prepared in anticipation of the Virginia General Assembly's consideration of proposals to require motorists to properly restrain their child passengers in safety devices. Three questions are discussed. First, are child restriant laws constitutional? Second, are the laws cost-effective? Third, which specific provisions tend to decrease costs and increase benefits? Three theories which have been advanced to argue that laws on the use of child restraints are constitutional were considered. Two of these are seriously flawed, but the third rests on precedents that have acknowledged the state's power to protect those incapable of protecting themselves. This third argument, paternalism, should be sufficient to find child restraint laws constitutional. The cost-effectiveness of child restraint legislation cannot be established empirically. The inadequacy of the literature can largely be traced to the immeasurability of the costs and benefits, and the lack of sufficient time to study the existing statutes. The two major costs imposed by child restraint legislation, enforcement costs and compliance costs, are easy to identify but hard to measure. The benefits of child restraint legislation, increased safety through increased use, are difficult to determine because it is unclear how many people will ignore the law or comply in ways that degrade the safety benefit. Moreover, any judgement on the cost-effectivenss of child restraint legislation inevitably hinges on a highly subjective evaluation of childhood death and injury. These difficulties are compounded by the fact that nine of the eleven existing laws were passed within the last year, leaving no time for careful analysis. Although absolute measures of the costs and benefits of legislation on the the use of child restraints are unavailable, some states have sought to enhance their statutes' marginal effectiveness by adding provisions that decrease costs or increase benefits. These provisions were analyzed with particular attention to the role of statutory exemptions in reducing costs and the impact of public education and monetary incentives in increasing the use of restraints. Again, there was a lack of empirical evidence, and these provisions had to be analyzed inferentially and intuitively. In discussing the fate of child restraint legislation in Virginia, frequent reference is made to the eleven states that have passed child restraint statutes. The text of those statutes and a comparison of their various provisions appear in Appendix A.

Regan, DJ
Virginia Department of Highways and Transportation VHTRC 82-R34, HS-032 960, Feb. 1982, 12p, App.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: Virginia Department of Highways and Transportation, Department of Transportation Safety, 1221 East Broad St, Richmond, Virginia, 23219

366824

SEDATING DRUGS AND AUTOMOBILE ACCIDENTS LEADING TO HOSPITALIZATION

The use of central nervous system depressant drugs among 244 people hospitalized for injuries suffered in an automobile accident was similar for drivers presumed at fault for the accident compared with other drivers and passengers. It was only slightly higher in the three groups than it was in the population at large. The absence of an important association in this population might be related to the warnings given to people filling prescriptions for these drugs.

Jick, H (Boston University Medical Center) Hunter, JR (Seattle Group Health Cooperative) Dinan, BJ (Boston University Medical Center) Madsen, S Stergachis, A (Seattle Group Health Cooperative) *American Journal of Public Health* Vol. 71 No. 12, HS-032 961, Dec. 1981, 2p, 1 Tab., 6 Ref.

Direct request for reprints to Dr. Hershel Jick at the Boston Collaborative Drug Surveillance Program.

Acknowledgment: National Highway Traffic Safety Administration
Order From: Boston Collaborative Drug Surveillance Program, 400-1 Totten Pond Road, Waltham, Massachusetts, 02154

366825

SMALL CAR SAFETY

This brief article states that it is impossible to make meaningful design changes to enhance the safety of the small car without first obtaining more and better data about accidents and applying the scientific method of analysis more than has been done in the past. Two factors are pointed out as having a marked effect on accident analyses--the driver factor (age and sex) and the seat belt factor (worn or not worn). Future accident analyses must eliminate the uncertainties caused by these and other factors before meaningful improvements in safety design can be brought about.

Automotive Engineering Vol. 90 No. 3, HS-032 962, Mar. 1982, pp 7-8

Acknowledgment: National Highway Traffic Safety Administration
Order From: ESL

366826

UNDERSTANDING MOTOR OILS

This basic article on motor oils discusses the reasons for proper maintenace, the importance of changing motor oil and why motor oil has different grades, weights and uses. It explains the letters and numbers on the tops of oil cans. In general, it gives a useful understanding of the lubricating qualities of motor oils which are the lifeline to engine longevity.

Madigan, T *Trailer Life* Vol. 42 No. 4, HS-032 963, Apr. 1982, pp 122-125, 5 Phot.

Acknowledgment: National Highway Traffic Safety Administration
Order From: Trailer Life Publishing Company Incorporated, 23945 Craftsman Road, Calabasas, California, 92132

366827

VISUAL ACUITY AS A FUNCTION OF AGE

The literature relating visual acuity and the aging process is reviewed. The Snellen fraction, parameters affecting visual acuity and difficulties in comparing different studies in visual acuity are discussed. Visual acuity was found to be a poor 20/1,000 to 20/800 at birth but improved to an almost normal acuity of 20/20 during the first year of life and remained relatively constant from 40 to 50 years of age. There was a moderate but steady decline in acuity as a person ages above 60 and on to the age of 80. The disease and physiological etiologies for this loss in acuity are provided. Methods which may be used to maintain or improve visual performance with age are suggested.

Pitts, DG (Houston University) *American Optometric Association Journal* Vol. 53 No. 2, HS-032 964, Feb. 1982, pp 117-124, 4 Fig., 3 Tab., 48 Ref.

Acknowledgment: National Highway Traffic Safety Administration
Order From: American Optometric Association, 243 N Lindbergh Boulevard, St Louis, Missouri, 63141

366828

AN INVENTORY OF SELECTED MATHEMATICAL MODELS RELATING TO THE MOTOR VEHICLE TRANSPORTATION SYSTEM AND ASSOCIATED LITERATURE. SECOND SUPPLEMENT

This volume continues an inventory of selected mathematical models (econometric, accounting, physical, etc.) relating to the motor vehicle transportation system, and of literature related to the subject matter or objectives of the models. This is a supplement to two earlier volumes that contain descriptions of 142 models and abstracts of 116 associated documents. This volume contains descriptions of 60 models added to the inventory, and a revised report on three of those from the earlier volumes. There are also 56 abstracts of 83 associated documents added to the collection. Each model predicts some variable (s) related to the motor vehicle transportation system as functions of policy-related variables. Most models have the potential for use in public policy analyses. Other models have been included because they have either advanced the development of models pertaining to the motor vehicle transportation system or they pertain to the public policies that may be analyzed by using models. The associated literature that is summarized contains data that may be used in running or building models, describes uses of models, or reports on evaluations of models.

Richardson, BC Segel, LD Roberts, DC Joscelyn, KB
Highway Safety Research Institute UM-HSRI-81-27, HS-032 965, 1982, 367p, Refs.

Acknowledgment: National Highway Traffic Safety Administration
Order From: Highway Safety Research Institute, Huron Parkway and Baxter Road, Ann Arbor, Michigan, 48109

366971

THE UNIFORM TIRE QUALITY GRADING STANDARD: THE GENESIS OF A MANDATORY REGULATION

This paper describes the development of the Uniform Tire Quality Grading Standard, a mandatory standard. It discusses the technical problems, the options provided by the Administrative Procedures Act, the decisions of the agency responsible for issuing the regulation, and the actions of the tire manufacturing industry. An insert explains the Department of Transportation's Tire Grading System.

Brenner, FC *ASTM Standardization News* Vol. 10 No. 3, HS-032 966, Mar. 1982, pp 21-28, Phots.

Acknowledgment: National Highway Traffic Safety Administration
Order From: American Society for Testing and Materials, 1916 Race Street, Philadelphia, Pennsylvania, 19103

366972

NEW RULES FOR DOTS

Since January 1, 1982 the U.S. Department of Transportation has been using a "modified" safety inspection procedure called Essential Elements Examination (EEE). This inspection takes less time and covers fewer items and that means that more vehicles will be inspected. This article offers guidelines to truckers on exactly what the inspection involves: brake system, coupling devices, fuel systems, hazardous materials, lighting devices, safe loading, suspension, tires, wheels and rims, windshield wipers, and the trucker himself who can also be put "out-of-service" principally for violations of hours of service regulations. The trucker is advised to run his own safety check regularly, and an alternative is offered for those who don't feel qualified to run a full inspection: Truckstops of America (TSA) currently conducts a 31-point safety check on trucks and trailers which covers all points in an EEE check and more. TSA officials are attempting to get official sanction for their inspection procedure.

Owner Operator Vol. 12 No. 2, HS-032 967, Apr. 1982, pp 14-20, Phots.

Acknowledgment: National Highway Traffic Safety Administration
Order From: Chilton Company, Chilton Way, Radnor, Pennsylvania, 19089

366973

AIR DISCS: THE GOOD AND THE BAD

The major differences between disc and drum brakes are compared. Drum brakes are subject to a variety of negative influences on performance and reliability. The drum brake fades. The air disc brake, on the other hand appears to be very tolerant of extreme overloads, and in the majority of cases, will stop a vehicle. One of the disadvantages of the disc brake is that it is expensive, but the price should eventually go down as production volumes increase. Another disadvantage is that air discs are less effective than drums in the parking mode, due to a comparatively low static coefficient of friction and lack of self-energization. But the foremost real world obstacle to air disc brakes is their incompatibility with drum brakes, which adversely affects both maintenance costs and performance. There are six major challenges confronting air disc acceptance today: Compatibiliity with drum brakes, the new, easy maintenance S-cams, long term durability, adequate service training for mechanics, timely parts back-up and the need for driver re-training. The article includes a brake comparison chart.

Standley, J *Owner Operator* Vol. 12 No. 2, HS-032 968, Apr. 1982, pp 63-69, Phots.

Acknowledgment: National Highway Traffic Safety Administration
Order From: Chilton Company, Chilton Way, Radnor, Pennsylvania, 19089

366974

SPARK IGNITION ENGINE MODEL BUILDING--AN IDENTIFICATION APPROACH TO THROTTLE-TORQUE RESPONSE

A rapidly obtained low-order sampled data description of the output response of driveshaft torque to throttle opening is described. Based upon a sampling interval of one engine revolution, the resulting fourth-order dynamic model is applicable over the range of 600-2000 rpm (vehicle speed 0-60 mph) for a 5.7 litre feedback carburetted engine and automatic transmission. Physical principles are used to obtain a block diagram of the system, and Landau's hyperstable identification algorithm is then used to determine the parameters of the model.

Morris, RL Borchets, RH Warlick, MV Hopkins, HG (Ford Motor Company) *International Journal of Vehicle Design* Vol. 3 No. 1, HS-032 974, 1982, pp 48-60, 4 Fig., 2 Tab., 15 Ref.

Acknowledgment: National Highway Traffic Safety Administration
Order From: Inderscience Enterprises Limited, La Motte Chambers, St Helier, Jersey, England

366975

TIRE ROLLING RESISTANCE EFFECT ON CONSUMPTION STUDIED

Research was conducted at EPA to obtain a correlation between the rolling resistance coefficients of three radial-ply tires and one bias-ply tire and the fuel consumption of two vehicles equipped with these tires. Results indicated that a change of 0.001 in tire rolling resistance gives an average fuel consumption effect of 2.2 cc/km on the EPA urban cycle and 1.5 cc/km over the highway cycle. An observed rule of thumb was that a 10% change in tire rolling resistance resulted in a two percent change in vehicle fuel consumption.

Automotive Engineering Vol. 90 No. 1, HS-032 977, Jan. 1982, pp 49-50, 1 Fig.

Acknowledgment: National Highway Traffic Safety Administration
Order From: ESL

366976

VETERANS' ADMINISTRATION AUTOMOTIVE ADAPTIVE EQUIPMENT PROGRAM

Contents: Statement by S.B. Hall, Jr., Texas, Chairman; Statements by witnesses: Dr Carl W. Hugues, Assistant Chief Medical Director for Professional Services, Department of Medicine and Surgery, Veterans' Administration; P. Riggin, Deputy Director, National Legislative Commission, the American Legion; G. H. Mansfield, Associate Legislative Director, Paralyzed Veterans of America; C.E. Joeckel, Jr., Assistant National Legislative Director, Disabled American Veterans. A letter to chairman Hall from E. Philip Riggin of June 15, 1981, regarding the cost of expanding benefit eligibility is included in an appendix.

United States Congress Serial 97-28, HS-032 978, June 1981, pp 1-32
Hearing before the Subcommittee on Compensation, Pension, and Insurance, Ninety-Seventh Congress, First Session, June 15, 1981.

Acknowledgment: National Highway Traffic Safety Administration
Order From: GPO

366977

THE PROBLEM WITH TEENAGERS AND MOTOR VEHICLE ACCIDENTS

This short article is a review of a study done by the Insurance Institute for Highway Safety which shows that nearly half of all deaths of teenagers 16 through 19 years old are the result of motor vehicle crashes. Although this age group represents only 8 per cent of the population, it sustains 17 per cent of all motor vehicle-related fatalities. The study also indicates that driving teenagers not only have a higher fatality rate themselves, but also contribute substantially to the death of others, and that teenage males have much higher rates of driver involvement in fatal crashes than females. Several possible preventive measures are recommended in the study including raising the minimum age of licensing to 18, making licensing conditional to the wearing of seat belts, eliminating driver education because it promotes early licensing, prohibiting teenagers from driving during some late evening/early morning hours, and implementing long-available crash-packaging technologies and cleaning up highways and roadside hazards. Parental role is also stressed.

Carolina Highways Vol. 37 No. 1, HS-032 979, Feb. 1982, 1p, 2 Fig.

Acknowledgment: National Highway Traffic Safety Administration
Order From: South Carolina Dept of Highways and Public Transp, 955 Park Street, Drawer 191, Columbia, South Carolina, 29202

366978

STATISTICAL ASPECTS OF INJURY SEVERITY PART III. MAKING ALLOWANCES FOR DIFFERENCES IN THE ASSESSMENT OF LEVEL OF TRAUMA

When accident data is collected by many people or organizations separately, the collectors may differ systematically in the way they assess injury severity. A statistical method of allowing for this is proposed and applied to a set of road accident data classified according to four sets of circumstances, five police force areas, and three severities of injury. It is concluded that appreciable improvements in the sensitivity of analysis can be obtained by allowing for possible differences in the grading of injury severity.

Hutchinson, TP (Coventry (Lanchester) Polytechnic, England) Lai, PW (Yorkshire Water Authority, England) *Transportation Science* Vol. 15 No. 4, HS-032 980, Nov. 1981, pp 297-305, 4 Tab.

Acknowledgment: National Highway Traffic Safety Administration
Order From: Operations Research Society of America, 428 East Preston Street, Baltimore, Maryland, 21202

366979

SEATED ANTHROPOMETRY: THE PROBLEMS INVOLVED IN A LARGE SCALE SURVEY OF DISABLED AND ELDERLY PEOPLE

This paper draws attention to a number of problems in the collection of anthropometric data for the design of easy chairs for disabled and elderly people. The solution of these problems is important if valid and reliable data on human body sizes are to be obtained from the elderly and disabled populations. These problems include gaining access to representative subjects in sufficient number, developing anthropometric equipment appropriate to the required measurements, training staff and calibrating their measurements to obtain estimates of within and between measurer variability so that appropriate chair specifications can be more readily defined. A description is given of approaches to these problems, and the solutions adopted, from an anthropometric survey carried out on elderly and disabled people by the Institute for Consumer Ergonomics.

Ergonomics Vol. 24 No. 11, HS-032 981, 1981, pp 831-845, 5 Fig., 2 Tab., 11 Ref.

Acknowledgment: National Highway Traffic Safety Administration
Order From: Taylor and Francis Limited, 4 John Street, London WC1N 2ET, England

366980

HOW SAFE IS YOUR CAR?

This report is based on real world data which includes the actual claims experience of 10 major insurance companies that insure about half of the private passenger vehicles in the United States. Results show that small cars are twice as likely as large cars to be involved in fatal single vehicle crashes and small American-built cars are safer than their Japanese-made counterparts (13 of the 17 cars with the worst injury loss experience are made in Japan). One of the reasons cited is that small cars are not designed and engineered with the special problems of smaller size, lighter weight and lower profile in mind. Conserving lives and reducing injuries while maintaining energy efficiency means making cars as lightweight as practical, while providing enough crash-absorbing outer structures and occupant compartment protection to assure maximum injury reduction in crashes. This article includes exhibits on the 1978-80 models with the best and the worst insurance injury claim experience, death per 100,000 registered cars by car size and crash type, relative injury claim frequencies by car size, comparisons of 1980 death rates by crash type (Japanese versus domestic small subcompacts), and relative injury claim frequencies small cars, 1978-1980 models. An insert considers improvements: manual belts, automatic belts, air bags non-lacerating windshields, child restraints and crashworthiness.

Haddon, W, Jr (Insurance Institute for Highway Safety) *Aide Magazine* HS-032 982, 1982, pp 1-7, Tabs., Phots.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: United Services Automobile Association Group, USAA Building, San Antonio, Texas, 78288

366981

PROCEEDINGS OF THE HUMAN FACTORS SOCIETY, 25TH ANNUAL MEETING

These proceedings contain the unedited, reproduced copies of papers submitted for presentation at the 25th Annual Meeting of the Human Factors Society. Three of the topics covered contain papers of interest in highway safety. These three topics are: visual performance; safety potpourri; and driver behavior and safety. Individual papers from these sections of the proceedings are entered in the TRIS data base.

Human Factors Society HS-032 983, 1981, 782p, Figs., Tabs., Refs.
Proceedings of the 25th Annual Meeting of the Human Factors Society, Rochester, NY, 12-16 October 1981.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: Human Factors Society, 1134 Montana, Santa Monica, California, 90403

366982

DRIVER EYE SCANNING OF WARNING SIGNS ON RURAL HIGHWAYS

Eye scanning recordings were made for two drivers on an eight mile section of a rural hilly two-lane highway. Data were collected in both directions (total 66 warning signs). Nighttime data (with low beams) was also collected for one of the drivers. An instrumented vehicle with a corneal reflection technique televison eye scanning recording system was used. Eye scanning behavior when approaching warning signs was analyzed for situations where there was no other traffic visible to the test driver. The results of this exploratory study suggest that: 1) drivers look practically at every warning sign, 2) drivers look on the average about 2.3 times at a warning sign, 3) the average first look distances for daytime and nighttime are about 450 ft (137m) or about 7 seconds away from the warning signs, 4) the first look distances expressed as percentages of the maximum warning sign sight distances appear to be slightly larger for the nighttime condition than for the daytime condition (nighttime average 83%, daytime average 65%), 5) the fixation durations for looking at the warning signs during nighttime are considerably longer than during daytime (daytime average 0.45 seconds, nightime average 0.75 seconds), and 6) different types of warning signs and warning sign arrangements appear to influence a driver's eye scanning behavior.

Zwahlen, H (Ohio University, Athens)
Human Factors Society HS-032 984, 1981, pp 33-37, 11 Fig., 4 Ref.
Presented at the 25th Annual Meeting of the Human Factors Society, Rochester, New York, 12-16 October 1981.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: Human Factors Society, 1134 Montana, Santa Monica, California, 90403

366983

MEASURING THE QUALITY OF DRIVERS' NIGHT VISION

The visual acuity of 30 male and female drivers aged 20-25, 40-45, and 60-65 years was examined under conditons of "high" background luminance, "low" background luminance, and "high" backgrond luminance with added glare. Results illustrate the characteristic decline in visual ability associated with increasing age and decreasing background luminance, and in addition show that strong correlations exist between scores achieved in the various background and glare conditions. Based on the data collected, it is estimated that the proportion of drivers who would fail a 20/40 visual acuity test at a "low" but representative background luminance ranges from less than 10% of the 20-25 year age group to more than 90% of the 60-65 year age group. It is recommended that a testing procedure be made available which would permit drivers to learn the extent of their potential nighttime seeing deficits, especially in the case of professional drivers who may be required to operate at night.

Sturgis, SP Osgood, DJ (Liberty Mutual Research Center, Massachusetts)
Human Factors Society HS-032 985, 1981, pp 38-42, 3 Fig., 13 Ref.
Presented at the 25th Annual Meeting of the Human Factors Society, Rochester, New York, 12-16 October 1981.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: Human Factors Society, 1134 Montana, Santa Monica, California, 90403

366984

COMPULSORY SEAT BELT USAGE AND DRIVER RISK TAKING BEHAVIOR

The danger compensation principle contends that the use of certain vehicle safety features such as seat belts may induce drivers to take greater risks. To test for this hypothesized effect, observational data on seat belt usage and driver risk taking were collected on 4812 drivers in Ontario, Canada, where seat belt usage is required by law. These data were compared with the results of a similar study conducted in Michigan, which has no usage law. The measure of driver risk taking in both studies was the time duration of following headway maintained by seat belt users and nonusers in high flow freeway traffic. Seat belts were worn by 51% of the Ontario drivers and by 14% of the drivers in Michigan. The Ontario usage rate before the law took effect was similar to the rate observed in the Michigan study. The results of both studies taken together are incompatible with the danger compensation principle. In the two jurisdictions a smaller percentage of users than nonusers drove at close, risky headways of less than one second, and these differences were of the same general magnitude. In the Michigan study it was concluded that voluntary usage is associated with the avoidance of risk. Likewise, in the Ontario study mandatory usage, rather than producing a tendency for increased risk taking as suggested by the danger compensation principle, was also associated with the avoidance of risk. Since the results provide no evidence for a danger compensation effect in car following behavior, it was concluded that this study presents no evidence that the safety benefits of seat belts would be diminished or neutralized by greater driver risk taking.

Evans, L Wasielewski, P von Buseck, CR (General Motors Research Laboratories)
Human Factors Society HS-032 986, 1981, pp 183-187, 2 Fig., 1 Tab., 15 Ref.
Presented at the 25th Annual Meeting of the Human Factors Society Rochester, New York, 12-16 October 1981.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: Human Factors Society, 1134 Montana, Santa Monica, California, 90403

366985

LATENCIES IN VEHICLE STEERING: IT IS POSSIBLE TO MEASURE DRIVERS RESPONSE LATENCIES AND ATTENTION UNOBTRUSIVELY ON THE ROAD

This paper reviews results from a series of studies in which latencies in driver/vehicle steering responses were measured on the road, unobtrusively, and with representative samples of unsuspecting drivers. Based on the fact that an obstacle on the road shoulder induces an avoidance response, i.e., a lateral displacement towards the middle of the road, a stimulus event was introduced at various distances when a car was approaching so that the time available to drivers for an avoidance response was known. It was found, first, that the average steering response started at latencies greater than 1 s, reached the half-way point at 2.5 s and the maximum at 3-4 s, depending on the situation. Second, this method was applied in a project on the effects of a warning flasher on driver behavior in school zones. It was found that the flasher reduced the drivers' steering response latencies. This was supposedly the first time to measure drivers' attention unobtrusively.

Summala, H (Helsinki University, Finland)
Human Factors Society HS-032 987, 1981, pp 711-715, 3 Fig., 13 Ref.
Presented at the 25th Annual Meeting of the Human Factors Society, Rochester, New York, 12-16 October 1981.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: Human Factors Society, 1134 Montana, Santa Monica, California, 90403

366986

A FEEDBACK DEVICE TO PROMOTE AUTOMOTIVE FUEL CONSERVATION

This paper reports on the preliminary results of a research effort being performed for the Department of Energy to investigate and evaluate methods of providing feedback to automobile drivers during vehicle operation which will help to promote fuel conservation. Popular so called "trip computers" and other fuel conservation devices are evaluated in the laboratory and on the highway. System concepts are developed to provide visual and auditory feedback to the opertor utilizing appropriate locations for additional on-board displays. A variety of feedback devices are installed in a test vehicle for evaluation of user preference and the effectiveness of the device in promoting fuel conservation.

Fazio, CP Cooksey, RW (Bendix Energy)
Human Factors Society HS-032 988, 1981, pp 716-720, 9 Fig., 1 Ref.
Presented at the 25th Annual Meeting of the Human Factors Society, Rochester, New York, 12-16 October 1981.

Acknowledgment: National Highway Traffic Safety Administration
Order From: Human Factors Society, 1134 Montana, Santa Monica, California, 90403

366987

MORE DRIVING SAFETY WITH A BETTER DESIGNED TRIP COMPUTER KEYBOARD

The need for more economic driving and the new possibilities of electronic equipment in cars lead to additional display and control devices for the driver. Such systems contain potential safety risks, if they are not designed with special emphasis on ergonomic requirements. Several keyboard concepts for an information center (trip computer) were compared experimentally. By measuring operating time, eye fixation time to keyboard and display etc. it was discovered, that a so called sequence keyboard with one key corresponding to each display digit or column has several advantages compared with a 10-key telephone keyboard. Especially the fixation time to each keyboard as a measure of the potential safety risk differed by 0.5 to 1.0 second. The longer operating time for the sequence keyboard compared with the telephone keyboard does not impair traffic safety because the sequence keyboard mostly was actuated without fixation and in accordance with the traffic situation the input sequence was interrupted.

Haller, R (Fraunhofer Inst Info und Datenverarbeit, W Ger) Bouis, D (Fraunhofer Inst Info und Datenverarbeit, W Ger) Heintz, F (Bosch (Robert) GmbH, West Germany)
Human Factors Society HS-032 989, 1981, pp 721-725, 9 Fig., 3 Ref.
Presented at the 25th Annual Meeting of the Human Factors Society, Rochester, New York, 12-16 October 1981.

Acknowledgment: National Highway Traffic Safety Administration
Order From: Human Factors Society, 1134 Montana, Santa Monica, California, 90403

366988

THE ON-LINE USE OF PERFORMANCE MEASURES TO PREDICT DRIVING FATIGUE

The experiment reported herein examined the use of driving performance measures to predict whether a driver was suffering from sleep-loss and/or excessive driving time. The experiment was conducted on a closed 7.2 km oval track. Each subject driver drove around the track at about 80 kph for three hours on the first test day. For the next 21 hours, each driver remained awake and, at regular selected intervals, performed a battery of behavioural tests. On day two, 24 hours after beginning the first driving period, each subject began to drive for a second 3-hour period. The data from each driving period in the first 27-hour session were analyzed to determine which set of performance variables best discriminated between the performance from each 3-hour driving period. The resulting variables were then programmed into a micro-computer located on-board the test vehicle. Two weeks later, each subject returned to repeat the original 27-hour schedule. During this session, however, the performance of each subject was monitored on-line by the on-board computer. If their performance deteriorated below the criterion established from the data originally collected, the computer, through a D/A link, attempted to alert each driver. Results suggest that the multivariate criteria are able to discriminate between performance from the second 3-hour drive and that from the first at better than chance levels. The results are discussed in terms of an alterness indicator for highway vehicles.

Attwood, DA Scott, PL (Road Safety Unit, Transport Canada)
Human Factors Society HS-032 990, 1981, pp 726-730, 4 Tab., 13 Ref.
Presented at the 25th Annual Meeting of the Human Factors Society, Rochester, New York, 12-16 October 1981.

Acknowledgment: National Highway Traffic Safety Administration
Order From: Human Factors Society, 1134 Montana, Santa Monica, California, 90403

366989

ALCOHOL, DRUGS AND ROAD TRAFFIC ACCIDENTS OF RURAL COLLEGE STUDENTS

The extent of alcohol and drug abuse among rural college students is identified and its effect upon road traffic accidents is examined. Data were obtained from a sample population of rural college students enrolled in four small institutions. Approximately 600 randomly chosen students were interviewed and asked to fill in questionnaires, 459 of which were completed. Subjects consisted of 226 male and 233 female students. All of those sampled had experimented with alcohol and half of them had taken drugs. Although the effect of socio-economic characteristics upon alcohol and drug consumption proved to be negligible, more frequent users came from lower income facilies. Nearly 3/4 of the sample observations reported "sometimes" driving after drinking and/or taking drugs. Close to 1/2 of the total sample had experienced at least one road traffic accident, 4/10 and 1/10 of which were alcohol and drug-related, respectively.

Koushki, PA (Clarkson College of Technology, New York)
Human Factors Society HS-032 991, 1981, pp 731-735, 3 Fig., 5 Tab., 9 Ref.
Presented at the 25th Annual Meeting of the Human Factors Society, Rochester, New York, 12-16 October, 1981.

Acknowledgment: National Highway Traffic Safety Administration
Order From: Human Factors Society, 1134 Montana, Santa Monica, California, 90403

366990

COMPLIANCE WITH AUTOMOTIVE SAFETY DEVICES AMONG ADOLESCENTS

The present study was undertaken to examine the automotive safety practices of patients in a general adolescent clinic and to explore the possibility that psychosocial differences exist between adolescents who are compliant with helmet and seat-belt usage and those who are not.

Litt, IF Steinerman, PR (Stanford University) *Journal of Pediatrics* Vol. 99 No. 3, HS-032 992, Sept. 1981, pp 484-486, 2 Tab., 10 Ref.

Acknowledgment: National Highway Traffic Safety Administration
Order From: Mosby (CV) Company, 11830 Westline Industrial Drive, St Louis, Missouri, 63141

366991

LEGAL MINIMUM DRINKING AGE CHANGES IN THE UNITED STATES: 1970-1981

This report presents the results of an investigation to obtain accurate information on drinking age changes directly from each of the 50 States and the District of Columbia regarding (1) which States have changed their minimum drinking age, (2) when the legal changes were implemented, and (3) the age groups and types of alcoholic beverages affected by the changes. The accuracy of such information is viewed as important for making reasonable and informal decisions on important public policy issues.

Wagenaar, AC (Highway Safety Research Institute) *Alcohol Health and Research World* Vol. 6 No. 2, HS-032 993, 1982, pp 21-26, 3 Tab., Refs.

Acknowledgment: National Highway Traffic Safety Administration
Order From: National Institute on Alcohol Abuse and Alcoholism, P.O. Box 2345, Rockville, Maryland, 20852

366992

THE TRACTOR DRIVER'S STEERING CONTROL TASK

A driver's most basic function is to control the direction in which the vehicle is moving. In agricultural field operations this guidance task assumes considerable importance since crop losses are influenced by steering. The paper discusses two models which may prove to be useful in the evaluation of the tractor driver's steering sub-task and in the longer term his total monitoring and control task. The experiments planned to evaluate the models are described briefly.

Bottoms, DJ (Nat'l Inst of Agricultural Engineering, England) *Ergonomics* Vol. 25 No. 1, HS-032 994, Jan. 1982, pp 31-39, 7 Fig., 9 Ref.

Acknowledgment: National Highway Traffic Safety Administration
Order From: Taylor and Francis Limited, 4 John Street, London WC1N 2ET, England

366993

HUMAN STRENGTH IN THE OPERATION OF TRACTOR PEDALS

Tractors require more pedals than road vehicles; the placement of these pedals presents a complex task for the designer. Since pedal position is an important determinant of the posture of a vehicle driver's pelvis and spine, it is essential that this problem be carefully considered. (The tractor driver's spine is already potentially at risk through high vibration levels and the need to twist in the seat while monitoring tools at the rear of the vehicle.) Anecdotal evidence suggests that an increasing number of women wish to drive tractors. The consequent increase in the variability of the user population will exacerbate existing design problems; pedal resistance must be within the strength capability of the weakest female driver but must not be so low as to make control difficult for a heavy footed male. The ergonomic literature concerning human strength in the operation of pedals, although extensive, is not entirely adequate for the tractor designers. Studies have either been conducted on subjects in specific postures, defined in anatomical terms which are not easy to relate to workspace design problems, or else have been ad hoc investigations of single pedal locations in specific vehicles. The present study is aimed at elucidating the biomechanical factors which influence human strength in the operation of a pedal. A better fundamental understanding of these problems would allow better advice to be given to designers. The following variables were investigated: (a) horizontal distance in front of the seat reference point (SRP), (b) vertical distance above and below SRP, (c) lateral distance from the midline, (d) direction of thrust, (e) use of the steering wheel for "bracing". Equal numbers of male and female subjects were tested. Solid shoes were worn and maximal voluntary isometric thrusts were made with the instep. The pedal was set in positions defined by percentages of the individual subject's stature; hence posture was relatively constant (given that the linkages of the lower limb are in similar proportion for most individuals). Distance ranged from 40 to 55% stature in front of the SRP, from 2.5% stature above the SRP to 12.5% below and from 10 to 20% to the right of the midline. From consideration of published evidence it was anticipated that the greatest forces would be exerted in the upper outer part of this range (55% stature in front of SRP, 2.5% above). This proved to be true. However, a pedal placed in this position would result in a very inappropriate driving posture. For a pedal location of 12.5% stature below SRP and 47.5% in front there was only a 12% reduction in thrust. Since the latter position results in a better driving posture than the former it is to be preferred. The paper concludes with a consideration of appropriate design specifications for tractor pedals and the ways in which they should be developed.

Pheasant, ST Harris, CM (Royal Free Hospital School of Medicine, England) *Ergonomics* Vol. 25 No. 1, HS-032 995, Jan. 1982, pp 53-63, 9 Fig., 11 Ref.

Acknowledgment: National Highway Traffic Safety Administration
Order From: Taylor and Francis Limited, 4 John Street, London WC1N 2ET, England

366994

HELMETS, WHAT'S NEW FROM THE HELMETMAKERS IN OPEN--AND FULL-FACE DESIGNS FOR DIRT AND STREET

In a crash where the motorcycle rider's head hits something, a helmet increases his chance for survival from slim to good simply by dissipating the energy of an impact more slowly. A number of standard tests determine how well the helmet can be expected to work: it must absorb energy, it must prevent penetration and it must stay on the head. There are three major test standards that helmet buyers should be aware of: The DOT (Department of Transportation) certification is a requirement for every helmet sold in the United States for highway use; the ANSI (American National Standard Institute) Z90.1-b-1979 certification is tougher, and in fact is the former Snell 1970 standard; the Snell Standards (named for the Snell Memorial Foundation) are by far the toughest and are formulated primarily for racing purposes. The current working Snell standard is Snell 1975, although in the process of being superseded by Snell 1980. Of course the helmet that passes the most stringent tests is more likely (but not guaranteed) to offer that last bit of added protection in a crash. The article includes several pages of photos and descriptions of three kinds of helmets: full face, open face and off-road.

Cycle Guide Vol. 17 No. 4, HS-032 996, Apr. 1982, 9p, Phots.

Acknowledgment: National Highway Traffic Safety Administration
Order From: Quinn Publications Incorporated, P.O. Box 6040, Compton, California, 90224

366995

QUIET MATERIALS WAR BECOMES LOUD

This paper reviews changes sweeping through the automotive-materials arena, that were the topics of discussions by experts at the 1982 SAE International Congress and Exposition: a shake-out is underway in substitute materials for cars, some lightweight materials that looked good before car sales reached depression levels are now loosing their appeal, but other products--high-strength, low-alloy (HSLA) steels, cast aluminum, plastic sheet-molding compounds (SMC) and magnesium, are coming on strong in Detroit.

Wrigley, A, Editor (Metalworking News and American Metal Market) *Ward's Auto World* Vol. 18 No. 3, HS-032 997, Mar. 1982, 3p

Acknowledgment: National Highway Traffic Safety Administration
Order From: Wards Communication Incorporated, 28 W Adams Street, Detroit, Michigan, 48226

366996

ACCIDENTS AND INJURIES IN CHILD VEHICLE OCCUPANTS IN NEW ZEALAND

Records of reported child vehicle occupant fatalities and injuries were examined. Child vehicle occupants accounted for approximately 5 percent of all road injuries and deaths in 1979, with an approximate hospital cost of one million dollars per year. It is thus worth spending considerable sums of money on countermeasures. The problem of parents' perception of risk is illustrated by the observation that annually only about one child in 1000 is injured and one in 50,000 dies as an occupant of a vehicle. International comparisons show New Zealand child occupant accident rates per 100,000 population to be of the same order as those of a selection of other developed countries.

Frith, WJ (Ministry of Transport, New Zealand) *New Zealand Medical Journal* Vol. 93 No. 686, HS-032 999, June 1981, pp 431-433, 2 Fig., 3 Ref.

Acknowledgment: National Highway Traffic Safety Administration
Order From: Otago Daily Times Limited, P.O. Box 181, Dunedin, New Zealand

366997

CARS AND KIDS: A SELF REPORT STUDY OF JUVENILE AUTO THEFT AND TRAFFIC VIOLATIONS

Although automobiles play an important part in adolescent life, juvenile misuse of cars has been understudied by sociologists. The favored group and the disadvantaged group perspectives have been proposed as descriptions of and tentative explanations for the presumed patterns of auto theft and to a lesser degree of traffic offenses. Using self-report data from Atlanta, this study found that neither approach was well supported. Contrary to previous research, auto theft is not a "pure" delinquency specialty. Auto thieves and traffic offenders were likely to be involved in other delinquent activities as well. Further, gang members were more likely to be auto misusers than youth who did not belong to a gang. While auto misuse is not a unique pattern of delinquency, on both empirical and theoretical levels, an explanation of the situated dynamics of auto misuse and not merely the correlates of auto misusers seems to be warranted.

Higgins, PC (South Carolina University, Columbia) Albrecht, GL (Illinois University, Urbana) *Scoiology and Social Research* Vol. 66 No. 1, HS-033 002, Oct. 1981, pp 29-41, 3 Tab., Refs.

Acknowledgment: National Highway Traffic Safety Administration
Order From: University Microfilms International, 300 North Zeeb Road, Ann Arbor, Michigan, 48106

366998

SHOULD STATES REQUIRE CHILD PASSENGER PROTECTION?

This commentary argues in favor of mandatory child restraint for the health and safety of children and their parents when riding in motor vehicles. It states that although mandatory laws for child restraint would discriminate economically because parents with limited incomes may not be able to afford the devices, other laws which now exist in the field of health and safety are similarly discriminatory.

Paulson, JA (Case Western Reserve University) *Hastings Center Report* Vol. 11 No. 3, HS-033 003, June 1981, pp 21-22

Acknowledgment: National Highway Traffic Safety Administration
Order From: Institute of Society, Ethics and Life Sciences, 360 Broadway, Hastings Center, Hastings on Hudson, New York, 10706

366999

A TWO-FREQUENCY RADAR FOR VEHICLE AUTOMATIC LATERAL CONTROL

The use of a side-looking radar in conjunction with a sidewall reflector is one means of obtaining lateral position information for use in vehicle automatic lateral control. The principle of operation of a two-frequency radar for such use is presented along with a discussion of the reflector design and construction difficulties. Some results of the full-scale testing of this radar using two different types of reflecting surfaces are included. The performance of this radar system is compared with that of the highly accurate wire follower. In general, tracking errors on the order of twice those obtained with the wire follower were achieved. It appears that with some redesign of the radar, performance equal to or better than that of the wire follower should eventually result.

Mayhan, RJ Bishel, RA *IEEE Transactions on Vehicular Technology* Vol. VT31 No. 1, HS-033 004, Feb. 1982, pp 32-39, 16 Fig., 1 Tab., Phots., 9 Ref.

Acknowledgment: National Highway Traffic Safety Administration
Order From: ESL

367000

AN EVALUATION OF THE IMPACT OF THE VIRGINIA DRIVER IMPROVEMENT PROGRAM ON NEGLIGENT DRIVING: 12 MONTH REPORT

This report presents the findings from an impact evaluation of the four basic treatment combinations of the rehabiliation component of the Virginia driver improvement program. The four combinations along with results of their evaluation are as follows: (1) the advisory letter--no effect; (2) the group interview--better posttreatment driving records than similar drivers not attending the interview, but no impact on accident experience; (3) a combination of the group interview and the advisory letter--completely ineffective; and (4) the personal interview-driver improvement clinic--highly effective in reducing subsequent minor convictions and in increasing the length of time a driver remained conviction free, but no effect on subsequent accident experience. It was concluded that the two most pressing needs of the driver improvement program are those for (1) improvement of the entry level remediation offered by the ineffectual advisory letter, and (2) modification of the program to more directly address accident avoidance as well as conviction reduction.

Lynn, C
Virginia Highway & Transportation Research Council Intrm Rpt. VHTRC 82-R43, HS-033 005, Feb. 1982, 41p, 7 Fig., 12 Tab., 4 Ref., App.

Acknowledgment: National Highway Traffic Safety Administration
Order From: Virginia Highway & Transportation Research Council, P.O. Box 3817, University Station, Charlottesville, Virginia, 22903

367001

ATTIUDES OF THE PUBLIC TOWARD AUTOMOBILE AND HOME INSURANCE

The first Public Attitude Monitor concentrated on automobile insurance. This second study tracked some of the key automobile insurance subjects from the first survey and added the following topics: (1) the role of insurance costs among the factors influencing the selection of a new car; (2) attitudes toward automobile safety; (3) attitudes toward home insurance; and (4) attitudes toward claim fraud. Like the 1980 survey, the 1981 AIRAC/ACLI survey was a sample of in-home interviews of adults age 18 and over. There were 1,544 interviews in 1981 and 1,549 in 1980. These adults were sampled using area probability methods, with the non-metropolitan area sampled at half the expected rate. Weighting was used to reflect this and other kinds of under-sampling. The percentages and averages in the tables are based on weighted figures. The numbers of cases given in the tables are unweighted to allow the reader to judge how large the sample or sub-sample was. The result is a sample that is theoretically representative of the non-institutionalized adult population of the continental United States. For more details on the sample and on statistical reliability related to sample size, see the Technical Appendix.

Public Attitude Monitor Res Rpt. A81-4, HS-033 006, Dec. 1981, 27p, 29 Tab., Apps.

Acknowledgment: National Highway Traffic Safety Administration
Order From: All-Industry Advisory Research Council, 7315 Wisconsin Avenue, Suite 231-W, Bethesda, Maryland, 20814

367002

HAZARDOUS MATERIALS: A GUIDE TO STATE AND LOCAL OFFICIALS

Transportation of hazardous materials is an issue of growing concern and interest to State and local officials. While the need for gasoline, pesticides, and other chemicals in our communities is recognized, accidental release of these materials in our environment could be very damaging. The federal government, as well as State and local governments, recognizes the need for both the safe and efficient transportation of hazardous materials in the U.S. The Hazardous Materials Transportation Act, enacted January 3, 1975, gives the Secretary of DOT regulatory and enforcement authority to protect the nation from risk to life and property. The evolving federal regulatory program includes thousands of substances and covers over 1100 pages in the U.S. Code of Federal Regulations. This document is intended as a guide to the federal regulatory program on the transportation of hazardous materials for State and local officials. Its objective is to increase understanding, awareness, and cooperation among the various levels of government.

Bierlein, LW
Office of the Secretary of Transportation HS-033 007, Feb. 1982, 67p

Acknowledgment: National Highway Traffic Safety Administration
Order From: GPO 361-428/1572

367088

INSURANCE LOSSES, COMPREHENSIVE COVERAGES NON-CRASH FIRE LOSSES 1979-1980 MODELS

This Highway Loss Data Institute report describes variations in both the frequency and size of insurance claims for non-crash related fire losses involving 1979 and 1980 model year private passenger cars. The principal findings are: (a) There were large variations in the non-crash fire loss experience of different cars. The car with the worst experience had fire losses that were more than fifty times greater than the results for the car with the best experience; (b) Among the individual vehicle series whose loss results are summarized, the 1979 MGB had the worst non-crash fire loss experience and the 1979 four-door Pontiac Bonneville had the best; (c) In each vehicle size class, sports or specialty models had the worst experience; (d) In most cases, two-door models had a higher frequency of fire losses and higher average loss payment results than corresponding four-door models; (e) There were large differences in the fire loss experience even among similar vehicles. For example, among 1980 two-door small subcompacts, the relative average loss payments per insured vehicle year ranged from a low of 24 for the Honda Accord to 102 for the Volkswagen Rabbit; and (f) There were large differences among individual vehicle series in the distribution of the size of fire claims. For example, only eight percent of the fire claims for the 1979 four-door Pontiac Bonneville exceeded $2,000. In contrast, 38 percent of the claims for the Chevrolet Corvette were in excess of $6,000.

Highway Loss Data Institute Res. Rpt. HLDI A-17, HS-033 009, Feb. 1982, 26p, Tabs., Refs.

Acknowledgment: National Highway Traffic Safety Administration
Order From: Highway Loss Data Institute, Watergate 600, Washington, D.C., 20037

367089

FUNCTIONAL IMPAIRMENT IN DRIVING

Written by a physician and professor of medicine, this article calls attention to the fact that impairment to driving is a more complex phenomenon than is commonly thought, involving both human and environmental aspects, as well as both young and old drivers. The major points are summarized as follows: At less extreme levels of impairment, the reasons for reduced function may often be misdiagnosed as carelessness or similar behavior, presumed to be correctable simply through effort and interest. Data indicate that, as a group, drivers with certain medical conditions do have increased crash risk. Currently, only empirical guides exist to help decide which of these persons may drive without restriction, which only with restriction, and which not at all. Impairment by alcohol commonly involves persons with long-term patterns of alcohol abuse. These individuals may be much more amenable to rehabilitation through knowledgeable medical assistance than most physicians are aware of.

Waller, JA (Vermont University) *New York State Journal of Medicine* Vol. 80 No. 13, HS-033 010, Dec. 1980, pp 1987-91, 1 Fig., 10 Ref.

Acknowledgment: National Highway Traffic Safety Administration
Order From: Medical Society of the State of New York, 420 Lakeville Road, Lake Success, New York, 11040

Highway Safety Literature

367090

IMPACT TIME. NOT ALL BUMPERS PERFORM AS PROMISED

Today, when I open the hood of an automobile, I see only paragraphs. This is how it is put by Professor Ernst Fiala as a representative for the entire branch of highly qualified researchers of the Volkswagen Plant to formulate the constraints placed on the design engineer. The Americans, who rapidly drew up legal regulations for the automobile have not always performed exemplary pioneer work in this area. In 1971, the first mandatory requirements imposed on bumper systems were published by the United States Traffic Department. They finally took effect on September 1, 1973. According to the law, the vehicle should suffer no permanent deformation on the body, no damage to the lights and no change in the chassis adjustment data following an impact at 5 mph (8 km/hr) against a solid barrier. The bumper itself was allowed to change position by 2 cm following testing and could undergo slight deformations. The American law has gradually and decisively had its effect on Europe. In an effort to achieve a better relationship between cost and benefit, the corresponding ECE Regulation No. 42 has formulated the same criteria, but the impact speed has been reduced to 4 km/hr (2.5 mph). This value is currently being discussed in the American House of Representatives and Senate in order to get away from the expensive and heavy bumper systems. [German]

Fuhrmann, T *Automotor Sport Test & Technik* HS-033 011, 1980, 15p
English translation available as reference copy only.

Acknowledgment: National Highway Traffic Safety Administration
Order From: United Motor Publishers, P.O. Box 1042, 7000 Stuttgart 1, West Germany

367091

SAVING COSTS WITH ENERGY-ABSORBING BUMPERS?

In the course of endeavours to keep repair costs for minor damage as low as possible, energy-absorbing bumpers have been developed. All American automobile models since 1974 must be equipped with such bumpers. Based on the assumed saving in costs by this novelty achieved, American automobile insurers have granted premium rebates of up to 20% on automobile own-damage insurances. So far, however, it has not been possible to revert to detailed analysis investigations in this connection. In Germany automobiles are also equipped with energy-absorbing bumpers. The question has necessarily therefore arisen to which extent German drivers could also be granted a premium rebate on such automobiles. Accordingly extensive tests have been conducted at the Automotive Engineering Division of the Allianz Centre for Technology to clarify this question. [German]

Danner, M Anselm, D *ATZ - Automobil Technische Zeitschrift* Vol. 80 No. 3, HS-033 012, Mar. 1978, pp 123-126, Figs., Phots, 11 Ref.
English translation available as reference copy only.

Acknowledgment: National Highway Traffic Safety Administration
Order From: ESL

367092

DEFENSIVE DRIVING TECHNIQUES. PROTECTING YOURSELF FROM OTHER MOTORISTS

Five rules for accident free driving are offered: (1) Aim high in steering; (2) Get the big picture; (3) Keep your eyes moving; (4) Leave yourself an out; and (5) Make sure they see you.

Smith, JG *Glass Dealer* Vol. 32 No. 3, HS-033 013, Mar. 1982, 1p, 1 Fig.

Acknowledgment: National Highway Traffic Safety Administration
Order From: National Glass Dealers Association, 1000 Connecticut Avenue, NW, Washington, D.C., 20036

367093

STOPPING RUST IN ITS TRACKS

This short article describes how a collision repair shop can help stop rust profitably. In the case described here a partially rusted back quarter panel poses an interesting problem because the rust has worked its way up the fuel filler, which forbids the use of a torch welder. The bodyman has to use air tools and plastic filler. Photos of the repair process are included.

White, WA *Collision* Vol. 6 No. 1, HS-033 014, Jan. 1982, pp 12-15

Acknowledgment: National Highway Traffic Safety Administration
Order From: Info-Quest Incorporated, P.O. Box 2627, Framingham, Massachusetts, 01701

367094

COPING WITH WINTER DRIVING

This article reviews some of the winter conditions and emergencies that face drivers: handling a skid, what to do when the windshield is abruptly coated with a grey film of ice, how to cope with reduced visibility or worse, complete blackout caused by headlights failure. Careful maintenance and driver preparedness can prevent many emergencies from happening.

Virginia Department of Highways Bulletin Vol. 47 No. 12, HS-033 015, Dec 1981, 3p, Figs.

Acknowledgment: National Highway Traffic Safety Administration
Order From: Virginia Department of Highways and Transportation, Highway Safety Division, 300 Turner Road, Richmond, Virgnia, 23225

367095

WINDSHIELD REPAIR SERVICES

The National Glass Dealers Association which has been following and reporting to members on developments in windshield repair services for many years, decided in the past several months to do an additional thorough review. First, letters were sent to the 60 major insurance companies and their general counsels. Second, in a separate concurrent effort, NGDA obtained and reviewed current advertising and promotional materials offered by several major suppliers or franchisors of windshield repair products and services. The conclusions from NGDA's new review are: The Association continues to take no position in favor or against the repair services, it does not and cannot recommend that its members become involved or not in repair services, questions about the legality, safety, and efficacy of repair are still unanswered and the insurance industry is far from unanimous in its attitude towards these last three points, finally, advertising and promotion for windshield repair services and products are improving, but continue to contain occasional untrue or misleading statements.

Jacobs, JA *Glass Dealer* Vol. 32 No. 3, HS-033 016, Mar. 1982, 2p, 1 Phot.

Acknowledgment: National Highway Traffic Safety Administration
Order From: National Glass Dealers Association, 1000 Connecticut Avenue, NW, Washington, D. C., 20036

367096

NEW COMPUTER SYSTEM HELPS UTAH STUDY ACCIDENT RATES

The Utah Department of Transportation is utilizing a new, versatile, user-oriented computer program called CARS (Central Accident Records System) to store, manage, and report traffic accident data, and a terminal for entering the data. The versatility of the system allows the Division of Safety to collect, store, update, and delete traffic accident and geographic data on a state-wide basis, and to easily generate information needed for reports. This sytem meets the standards set for accident records by the National Highway Traffic Safety Administration. One of the most important benefits of this new system is that it helps to identify the causes of accidents. Another by-product of the new system has been the development of a standard highway reference system that can be used throughout the Department. Finally the system provides the data needed to ensure that the Department's limited resources are expended in the right places.

Geurts, CA (Utah Department of Transportation) *Traffic Safety* Vol. 82 No. 2, HS-033 017, Mar. 1982, pp 10-11

Acknowledgment: National Highway Traffic Safety Administration
Order From: National Safety Council, 444 North Michigan Avenue, Chicago, Illinois, 60611

367097

THE SURVIVORS TELL THEIR TALES

The National Survivor Story File, compiled by the National Safety Council, is a nationwide effort to collect the tales of people who survived motor vehicle accidents, and were protected from more serious injuries due to their use of safety belts, child safety seats or air cushion systems. Information on each survivor's story is sent to the person's senator and representative in Congress where it is hoped that the story will have an effect on future restraint legislation. This article presents a sampling of some of the more interesting survivor stories collected so far.

Overend, RB *Traffic Safety* Vol. 82 No. 2, HS-033 018, Mar. 1982, 6p, Phots.

Copies of the Accident Survivor File form are available from Mrs Nancy Berk, National Safety Council, 1705 DeSales St. NW, Washington, D.C. 20036

Acknowledgment: National Highway Traffic Safety Administration
Order From: National Safety Council, 444 North Michigan Avenue, Chicago, Illinois, 60611

367098

HOW MUCH DO CHILD CARE BOOKS CARE ABOUT SAFETY RESTRAINTS?

This article describes a study funded by the National Highway Traffic Safety Administration and administered by the Minnesota Department of Public Safety's Office of Public Information. This study investigates how child automobile travel safety is covered in generally available child rearing literature.

Kokesch, P (Minnesota Department of Public Safety) *Traffic Safety* Vol. 82 No. 2, HS-033 019, Mar. 1982, pp 18-19, Phots.

For copies of the survey's ratings and the annotated bibliography, please contact Paul Kokesch, Office of Public Information, Department of Public Safety, 318 Transportation Building, St Paul, Minn. 55155

Acknowledgment: National Highway Traffic Safety Administration
Order From: National Safety Council, 444 North Michigan Avenue, Chicago, Illinois, 60611

367099

THE PAINFUL ART OF SERVICING HIGH-TECH CARS

Thanks to emission regulations and fuel economy standards, today's new cars contain a lot of electronic hardware. This, coupled to front-drive layouts and combined with revamped body construction techniques, results in a generation of cars that are truly different. Much of what makes today's cars so new also makes them hard to repair. This article reviews in detail the new business of repair and maintenance and the necessity for auto makers and dealers to put more effort into providing better service.

Scanlon, M *Ward's Auto World* Vol. 18 No. 2, HS-033 022, Feb. 1982, pp 51-54, 1 Fig., Phots.

Acknowledgment: National Highway Traffic Safety Administration
Order From: Wards Communications, Incorporated, 28 W Adams Street, Detroit, Michigan, 48226

367100

CERVICAL INJURIES SUFFERED IN AUTOMOBILE CRAHSES

The National Crash Severity Study data in which occupants sustained severe, serious, critical-to-life, or fatal cervical injuries were reviewed. Of passenger cars damaged severely enough to be towed from the scene, it is estimated that one in 300 occupants sustained a neck injury of a severe nature. The neck-injury rate rose to one in 14 occupants for those ejected from their cars, although many of these injuries resulted from contacts within the car before or during the process of ejection. Severe neck injuries were rather rare in cars struck in the rear, but were more common in frontal and side impacts. Occupants between 16 and 25 years of age had such injuries more than twice as often as those in any other age group. Most of the neck injuries of a more severe nature involved the cervical spine or spinal cord. Injuries of the anterior aspect of the neck were relatively infrequent, and usually resulted from direct blunt impacts. National projections of the number of fatalities related to cervical injuries indicates that 5940 deaths, or approximately 20% of all in-car deaths, include fatal cervical spine injuries, and that about 500 cases of quadriplegia per year result from automobile accidents.

Huelke, DF O'Day, J Mendelsohn, RA (Michigan University, Ann Arbor) *Journal of Neurosurgery* Vol. 54 No. 3, HS-033 023, Mar. 1981, pp 316-322, 6 Tab., 39 Ref.

Direct reprint requests to Donald F. Huelke at Michigan University Medical School.

Acknowledgment: National Highway Traffic Safety Administration
Order From: Michigan University Medical School, Department of Anatomy, 3738 Medical Science II Building, Ann Arbor, Michigan, 48109

367101

CHILDREN IN CRASHES: HOW SERIOUS A PROBLEM?

Considerable interest and concern are shown by the medical profession and the general public about Reye's syndrome, but tragically enough, a similar level of concern does not seem to exist relative to the leading cause of death to children-the motor vehicle accident. Some comparisons of the relative magnitude of the problems are made in this article, and rates of occurence within the population at risk are given. The use of any child restraining system has been found to reduce child fatalities by about 90 percent. There is a need for strong advocacy from the medical profession for crash injury prevention.

Huelke, DF Weber, KB *Michigan University Medical Center Journal* Vol. 46 No. 3-4, HS-033 024, July 1980, pp 38-39, 9 Ref.

Acknowledgment: National Highway Traffic Safety Administration
Order From: Michigan University, Ann Arbor, Ann Arbor, Michigan, 48109

367102

PASSIVE RESTRAINTS: A SCIENTISTS VIEW

This report discusses the effectiveness of passive restraint systems. It points out that while a significant amount of laboratory testing on passive restraints has been done, there have not been enough real-world crashes of cars equipped with passive restraints to provide the information needed to adequately evaluate the various passive restraint designs. In conclusion it is stated that NHTSA and the automotive industry have both monitored crashes of cars currently using air bags, and plans are being made to use the National Accident Sampling System to continue this monitoring to obtain adequate data.

Huelke, DF O'Day, J
Brookings Institution HS-033 025, 1981, pp 21-35

From The Scientific Basis of Health and Safety Regulations, Robert W. Crandall and Lester Lave, Editors, The Brookings Institution, Washington D.C., 1981.

Acknowledgment: National Highway Traffic Safety Administration
Order From: Brookings Institution, 1775 Massachusetts Avenue, NW, Washington, D.C., 20036

367103

DRUNK DRIVING: A KILLER WE CAN STOP

Since before the turn of the century, when the first drunk-driving arrest was recorded, the government, the media and civic groups have repeatedly attempted to alter drinking driving behavior with "tough" legislation, enforcement crackdowns, public awareness campaigns and catchy slogans. This article reviews the problem, here and abroad, legislation, government studies, enforcement and actions by citizen lobbies.

Snyder, J (St Paul Fire and Marine Insurance Company) *Journal of Insurance* Vol. 43 HS-033 027, Mar. 1982, pp 3-11, Phots.

Acknowledgment: National Highway Traffic Safety Administration
Order From: Insurance Information Institute, 110 William Street, New York, New York, 10038

367104

AUTO BODY REPAIR

This article includes a rating table which lists 83 body shops, including independents, dealers, and several shops that are franchised by MAACO, customer ratings, results of complaint counts made at local government offices of consumer affairs, reports of recommendations made by claim adjusters, and information on mechanic certification. In addition, there are price index scores based on body repair and painting prices gathered by Checkbook researchers.

Checkbook Magazine Vol. 3 No. 4, HS-033 028, 1982, pp 2-5, Phots.

Acknowledgment: National Highway Traffic Safety Administration
Order From: Washington Center for the Study of Services, 1518 K Street, NW, Washington, D.C., 20005

367105

CHILD SAFETY SEATS

New Federal safety regulations require the manufacturers of child safety seats to certify that their seats would pass a prescribed and rigorous crash test. Although all safety seats may meet minimum safety requirements, they are not equally easy to install, equally convenient to use, or equally comfortable. Infant seats and convertible and toddler seats are reviewed in detail and ratings are given by brand and model, restraining system, accommodations and installation. An insert on state legislation is included, along with child fatality rates in Tennessee, where child restraints are mandatory.

Consumer Reports Vol. 47 No. 4, HS-033 029, Apr. 1982, pp 171-176, Figs.

Acknowledgment: National Highway Traffic Safety Administration

Order From: Consumers Union of U.S., Incorporated, 256 Washington Street, Mount Vernon, New York, 10550

367106

APPLICATIONS OF AN OPTIMAL PREVIEW CONTROL FOR SIMULATION OF CLOSED-LOOP AUTOMOBILE DRIVING

An optimal preview control method is applied to the automobile path following problem. The technique is first used to examine the straight-line regulatory driving task and results compared with similar experimental measurements. The method is further demonstrated by closed-loop simulation of an automobile driver/vehicle system during transient lane-change maneuvers. The computer simulation results are compared with equivalent vehicle test measurements.

MacAdam, C (Highway Safety Research Institute) *IEEE Transactions on Systems, Man and Cybernetics* Vol. SMC-11, N6, HS-033 031, June 1981, pp 393-399, 9 Fig., 13 Ref., App.

Acknowledgment: National Highway Traffic Safety Administration
Order From: ESL

367107

AERODYNAMIC HEADLAMPS, BEAM INTO NEW CAR PROGRAMS

The automobile industry plans to introduce, by the 1984 model year, aerodynamic headlamps that could save over 22 million gallons of gasoline a year, provide stylists with greater design flexibilty and bring the U.S. into closer harmonization with the European headlamps requirements. Ford and Chrysler have petitioned the National Highway Traffic Safety Administration (NHTSA) for a rule change and the Society of Automotive Engineers and NHTSA are cooperating to satisfy both automakers. The new types of headlight are described briefly.

McElroy, J *Automotive Industries* Vol. 162 No. 4, HS-033 032, Apr. 1982, pp 47-49, 1 Tab., Phots.

For reprint information contact Automotive Industries, Marketing Department, Radnor, Pennsylvania, 19089.

Acknowledgment: National Highway Traffic Safety Administration
Order From: Chilton Company, Chilton Way, Radnor, Pennsylvania, 19089

367108

ENGINE LOAD CONTROLLED VIA EARLY INTAKE VALVE CLOSING

Early closing of an engine's intake valve as a means for load control in a homogeneous-charge spark ignition powerplant was examined, both experimentally using a special intake valve cam, and analytically, using an engine simulation. Comparison to a conventional throttled engine operating at part loads shows the early-intake-valve-closing (EIVC) engine to have lower pumping loss, lower specific fuel consumption, lower cylinder gas temperature, lower heat transfer, lower NOx emissions, similar combustion duration and cyclic variability, and somewhat higher HC emissions. However, some of the fuel economy benefit of the EIVC engine would be offset by the frictional losses of a control mechanism.

Automotive Engineering Vol. 90 No. 4, HS-033 033, Apr. 1982, pp 51-55, 4 Fig. Based on SAE paper 820408, Controlling Engine Load By Means of Early Intake-Valve Closing, by James H. Tuttle, Engine Research Department, General Motors Research Laboratories.

Acknowledgment: National Highway Traffic Safety Administration
Order From: ESL

367109

WHEEL ATTACHMENT: A PRIMER

This article reviews the considerations involved in designing wheel attachments for automobiles. Wheel attachment has two functions: it must provide wheel retention under various vehicle maneuvers and it must allow wheel removal for service of tires, brakes, and other vehicle components. These functions are taken into account in this review which covers attachment configurations, applied service loads, failure modes, and maximizing attachment strength.

Automotive Engineering Vol. 90 No. 4, HS-033 034, Apr. 1982, pp 43-48, 6 Fig. Based on SAE paper 820340, Automobile Wheel Attachment Design Considerations, by John D. Parisen, General Motors Corporation.

Acknowledgment: National Highway Traffic Safety Administration
Order From: ESL

367110

ENGINEERING PLASTICS FIND CONSTRUCTION EQUIPMENT APPLICATIONS

This article discusses the physical and mechanical properties of engineering plastics and reviews their use in construction equipment. Structures of these organic chemicals help to explain their properties, some of which are unique to polymeric materials and include low friction coefficients, wear and fatigue resistance, and contact pressure reduction. Wear pads, seal rings, bearing bushings, sheaves, tubing, hydraulic hoses, and functional coatings are among the applications presently used in construction industries.

Automotive Engineering Vol. 90 No. 4, HS-033 035, Apr. 1982, pp 25-29, 7 Fig. Based on SAE paper 820641, Engineering Plastics Components in Construction Equipment, by John H. Chen and Robert A. Alberts, the Polymer Corporation.

Acknowledgment: National Highway Traffic Safety Administration
Order From: ESL

367111

CAR REPAIR RIP-OFFS AND HOW TO AVOID THEM

Shoddy and needless auto repairs are the nation's biggest consumer problem, costing $125 a year for every car in the United States according to the Federal Trade Commission. This article reviews some examples of this problem and offers some protective measures.

Glickman, AP *Reader's Digest* HS-033 036, Apr. 1982, pp 70-74

Acknowledgment: National Highway Traffic Safety Administration
Order From: Reader's Digest Association, Incorporated, Pleasantville, New York, 10570

367112

TROUBLE SHOOTING FORD'S MICROCOMPUTER CONTROL UNIT--PART I

This article explains how to diagnose a computer related malfunction in Ford cars and light trucks. Ford has used 2 different computerized systems since 1978: Electronic Engine Control (EEC) and the Microprocessor (also called microcomputer) Control Unit (MCU). EEC controls ignition timing, air/fuel ratio, and exhaust gas recirculation (EGR), while MCU controls air/fuel ratio and EGR. To diagnose EEC problems, one needs a very expensive piece of equipment and it's more cost effective to find a technician equipped with the tester needed. However, a home mechanic can handle MCU troubleshooting and repair with the help of a digital tester called the Self-Test-Automatic-Readout (STAR) tester, which cost about $100. This article includes a list of cars having one of the EEC systems, how to find out if your car has MCU, and a chart of MCU parts and what they do.

Schultz, M *Popular Mechanics* Vol. 155 No. 4, HS-033 037, Apr. 1982, pp 53-56, Figs., Tabs., Phots.

Acknowledgment: National Highway Traffic Safety Administration
Order From: Hearst Magazines, 224 West 57th Street, New York, New York, 10019

367113

WHAT YOU NEED TO KNOW ABOUT PISTON RINGS

This article states that when piston rings are to be replaced, vehicle owners should be aware of the several types available and the various materials used relative to their vehicle situation, so that the proper choice of piston rings can be made even though a mechanic will do the work. The article then proceeds with a discussion of the types available and the conditions under which they should be used, emphasizing the importance of proper selection and proper break-in to ensure that the rings seat.

Geraghty, J *Trailer Life* Vol. 42 No. 5, HS-033 038, May 1982, 4p, Figs., Phots.

Acknowledgment: National Highway Traffic Safety Administration
Order From: Trailer Life Publishing Company Incorporated, 23945 Craftsman Road, Calabasas, California, 92132

367114

TRAILER MAINTENANCE RALLY

In Spring 1981 the Northern Virginia Unit of the Wally Byam Caravan Club (Airstream) conducted a Trailer Maintenance Rally at the KOA Campground in Front Royal Virginia. The program covered four basic areas: (1) a weigh scale program; (2) propane system checkout; (3) electrical system checkout; and (4) general maintenance. This article presents a discussion of each of these areas, indicating what was accomplished at the rally. In conclusion it is stated that the rally was interesting, productive and educational, and it could be duplicated by other organizations. Also, it would bring together the State Highway Patrol, the State Highway or Transportation Department, and recreational vehicle owners.

Miller, WR *Trailer Life* Vol. 42 No. 5, HS-033 039, May 1982, pp 105-108, Phots.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: Trailer Life Publishing Company Incorporated, 23945 Craftsman Road, Calabasas, California, 92132

367115

CHILDREN WEARING APPROVED RESTRAINTS AND ADULTS' BELTS IN CRASHES

This report is based upon an in-depth study (IMPACT 7) of 73 children who occupied cars in 231 crashes on New South Wales roads. The crashes were reported to involve children who were transported from the scene by ambulance. The study focused on restrained children under eight years of age. This was in view of legislation which provided legal impetus from March, 1977 in New South Wales for children to wear adult belts or child restraints of a type approved by the Standards Association of Australia if available when travelling in passenger vehicles. Children in approved child restraints were afforded very good crash protection in often severe crashes when their restraints were installed correctly and not loaded directly by other parts of their vehicles. One child died when her child seat was broken from behind by boot luggage and the dislocated car rear seat back. Three point emergency locking retractor and lap/sash seat belts also provided very good protection. One fatality however was reached by deep side vehicle intrusion, and another occurred when the loose sash strap of a lap/sash belt lay across the face of a child. Lap belts were ineffective for two fatalities because of a lack of control of excursion and possibility of ejection. There was little doubt that five children would have died if unrestrained.

Corben, CW Herbert, DC
New South Wales Dept of Motor Transport, Australia HS-033 040, Jan. 1981, 53p, Figs., Tabs., Phots., Refs., Apps.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: New South Wales Dept of Motor Transport, Australia, Traffic Accident Research Unit, 56 Rothschild Avenue, Roseberry, New South Wales 2018, Australia

367116

ROAD VEHICLES-MOTOR VEHICLES-FLASHER UNITS

This International Standard defines the electrical characteristics with which flasher units for motor vehicles shall comply when submitted for acceptance. It applies to flashers intended for use on motor vehicles with 12V or 24V systems which may or may not be equipped for a towed vehicle. It can be applied to motorcycles. Compliance tests are set forth, along with number of samples to be tested and the sequence of the individual tests.

International Organization for Standardization ISO 4082-1981 (E), HS-032 041, 1981, 7p

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: International Organization for Standardization, 1 rue de Varembe, CH-1211 Geneva 20, Switzerland

367117

DRIVING INTO SPRING

This article offers helpful suggestions to automobile owners in the preparation of their cars for spring driving and tips for safe driving in the conditions they will encounter as spring arrives. Automobile maintenance suggestions cover such items as tires, windshield wipers, and checking for salt damage. Safe driving tips deal with such conditions as potholes, slippery pavements, and visibility in the rain.

Driver Vol. 15 No. 10, HS-033 042, May 1982, 6p, Phots.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: US Air Force Inspection and Safety Center, Norton AFB, California, 92409

367118

NEW PROCESSES IN RUST PREVENTION

A brief overview is given of the many types of materials and processes used in GM cars to inhibit rust. Among the leading rust-fighters used are steel precoated with zinc, one-sided and two-sided galvanized steel, an improved primer paint process, aluminum, various types of sealers and wax-based sprays. Owners are admonished to help by washing their cars frequently.

Autobody and the Reconditioned Car Vol. 61 No. 3, HS-033 043, May 1982, pp 30-31

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: Spokesman Publishing Company, 4030 Mt Carmel-Tobasco Road, Cincinnati, Ohio, 45230

367119

THE EFFECTIVENESS OF FOUR-WAY FLASHERS ON STATIONERY AND SLOW-MOVING VEHICLES

To determine the efficacy of using four-way flashers (and other devices) on stopped and slow-moving vehicles, the FHWA sponsored two separate experiments at the Maine Department of Transportation's Facility in Pittsfield, Maine. The sites used for the experiments were on a two-way, two-lane rural road (U.S. Route 2) with a maximum volume of about 4,000 vehicles per day. This article describes the basic experiment design and gives the results of the experiments. Concerning slow-moving vehicles, the major finding was that the most effective device of those tested for decreasing the potential of a dangerous conflict when a faster moving vehicle overtakes a slow one on an upgrade was the use of standard four-way flashers by the slow vehicles. Specific positive effects included improvement in the initial reaction distance, closing rate, and minimum headways. Concerning vehicles parked or disabled at the roadside, the major finding was that use of four-way flashers is effective for warning approaching motorists of the presence of such vehicles.

Lyles, RW (Lyles (Richard) Associates) *ITE Journal* Vol. 52 No. 4, HS-033 047, Apr. 1982, pp 19-21, 1 Fig., 5 Ref.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: Institute of Transportation Engineers, 525 School Street, SW, Suite 410, Washington, D.C., 20024

367142

THE ROLE OF THE MUNICIPALITY AS REGARDS DANGEROUS FREIGHT TRANSPORT [DE ROL VAN DE GEMEENTE BIJ HET VERVOER VAN GEVAARLIJKE STOFFEN]

The Dutch legislation regarding the transport of dangerous materials is far from clear. Also for the local authorities the legislation causes difficulties. This report discusses the act in such a way that the role of the local authorities in the transport of dangerous materials is specified. After a broad introduction, the loading and delivery of dangerous materials, the itinerary through the city by highway, rail or water, the prevention of accidents and what to do in case of emergencies, and industries transporting dangerous materials are discussed. (TRRL) [Dutch]

Kaag-Vanrp, AG
Instituut voor Bestuurswetenschappen Monograph June 1981, 155p, Figs., Tabs., Refs.

ACKNOWLEDGMENT: TRRL (IRRD 261972), Institute for Road Safety Research

367143

SAFETY CONSIDERATIONS BY INSTALLATION OF TRAFFIC SIGNALS [VEILIGHEIDSOVERWEGINGEN BIJ HET PLAATSEN VAN VERKEERSLICHTEN]

The international literature does not allow general statements regarding the effect of traffic signals on accidents at intersections. However, a number of factors influencing accidents is given, such as the 24-hours traffic volume and the number of accidents before traffic signals are installed. The effect of the installation of traffic signals varies with road user categories and accident types. For instance, right-angle accidents generally decrease after signalization whereas rear-end accidents at best do not increase. At signalized intersections left turns comparatively often lead to accidents. Exclusive left-turn signals are therefore recommended. Other factors dealt with in the literature are: intersection layout, duration of the amber phase, switching off the installation at night, separation of traffic flows, and co-ordination of traffic signal installations. (TRRL) [Dutch]

Welleman, AG
Institute for Road Safety Research Monograph R-81-35, 1981, 36p, 1 Fig., 4 Tab., 20 Ref.

ACKNOWLEDGMENT: TRRL (IRRD 261973), Institute for Road Safety Research

367258
TRAFFIC LAWS ANNOTATED. ANNUAL SUPPLEMENT 1979
This Supplement makes information in Traffic Laws Annotated (1979) current as of January 1, 1981, by reflecting all relevant 1979 and 1980 state legislation. This Supplement also includes changes made in the Uniform Vehicle Code by the National Committee on Uniform Traffic Laws and Ordinances when it met on August 15-17, 1979. This Supplement is designed for use in updating the information presented in the main volume of the TLA. It augments, but does not replace, the Statutory Annotations shown. It utilizes an identical numbering and caption system but thereafter contains only a report on state laws adopted, amended or repealed in 1979 or 1980 that would in any way alter the original Annotation.

National Highway Traffic Safety Administration HS-806 044, Jan. 1982, 33p

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: GPO

367259
IMPROVED COMMERCIAL VEHICLE CONSPICUITY AND SIGNALLING SYSTEMS. ANALYSES, EXPERIMENTS AND DESIGN RECOMMENDATIONS. TASK II.
The purpose of this project is the design and testing of marking and signalling systems for large commerical vehicles. Results of Task II are presented including: (1) Augmented conspicuity designs using retroreflective materials, intended for use in field tests or as an after-market add-on; (2) An integrated conspicuity design incorporating improved lighting, signalling and reflectorization, intended for original manufacture; and (3) A plan for field tests to compare accident rates of the recommended designs with current practice. Detailed rationale is given for the designs, including descriptions of six experiments on truck conspicuity. The recommended design includes vehicle perimeter outlining using retroreflective materials, reflectorized flaps, the addition and relocations of turn signals to ensure their visibility to other drivers, changes in the number and location of clearance and I.D. lights, and separation of functions for rear signalling.

Zeidman, K Burger, WJ Smith, RL Mulholland, MU Sharkey, TJ
Vector Enterprises Incorporated, National Highway Traffic Safety Administration, (VR 81-4) Intrm Rpt. HS-806 098, Oct. 1981, 192p, Figs., Tabs., Refs.
Contract DTNH22-80-C-07034

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: NTIS PB82-214214

367260
IMPROVED COMMERCIAL VEHICLE CONSPICUITY AND SIGNALLING SYSTEM. ACCIDENT ANALYSIS AND FUNCTIONAL REQUIREMENTS. TASK 1
The purpose of this project is the design and testing of improved marking and lighting systems for large commercial vehicles. Results of Task I are presented covering: (1) U.S. Truck population characteristics; (2) Analysis of vehicle-into-truck accidents; (3) Analysis of driver capabilities; (4) Analysis of FMVSS 108; (5) Development of functional requirements for marking and signalling systems; and (6) Analysis of retroreflective materials. An extensive bibliography is included. Fleet operational experience with retroflective markings and the results of a pilot study of car and truck rear-light intensities are also reported. It is concluded that improved marking and signalling have a high probability of reducing vehicle-into-truck accidents.

Burger, WJ Smith, RL Zeidman, K Mulholland, MU Bardales, MC Sharkey, TJ
Vector Enterprises Incorporated, National Highway Traffic Safety Administration Intrm Rpt. HS-806 100, Mar. 1981, 274p, Figs., Tabs., Refs.
Contract DTNH22-80-C-07034

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: NTIS PB82-217787

367261
FORD ESCORT GL BASELINE WEIGHT DATA
To provide baseline weight and specification data for use in future material substitution/weight and cost reduction studies, a teardown study was performed on the 1981 Escort three-door sedan. The results, summarized graphically and in detail by major components, provides a basis for determining the weight savings, design requirements and cost impact of material substitution for expanded use of aluminum or plastics. It should be noted-that unless a component that was welded to the basic body-in-white was considered a candidate for substitute material, the study left the component intact and included in the weight of an assembly. Selection of candidate material substitution components was done by the NHTSA contract monitor in conjunction with advice from TSC and the teardown contractor.

Andon, J Burke, C Renick, S
South Coast Technology, Incorporated, National Highway Traffic Safety Administration HS-806 103, May 1981, 93p, Figs., Tabs., Phots., Refs.
Contract DOT-HS-9-0211

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: NTIS PB82-217555

367262
GM X BODY MATERIAL SUBSTITUTION WEIGHT REDUCTION/COST EFFECTIVENESS STUDY
The purpose of this study was to determine the near term weight reduction potential through use of substitute materials, high strength alloy steel, aluminum and plastics. The baseline vehicle used was the new front wheel drive GM X Body (Oldsmobile Omega). Significant weight reduction potential was identified, mostly at higher costs as the base vehicle clearly demonstrated that every effort was made to reduce weight without incurring added costs. The results of the study present shopping lists that would prove useful in the preparation of a weight reduction program.

Siegel, HM Burke, CE Renick, S
South Coast Technology, Incorporated, National Highway Traffic Safety Administration Final Rpt. HS-806 104, Oct. 1981, 68p, Figs., Tabs
Contract DOT-HS-7-01790

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: NTIS

367263
STUDY TO DETERMINE AVAILABILITY OF PARTS AT DEALERS DURING A RECALL CAMPAIGN
A significant number of complaints have been generated by automobile owners about their difficulties in having recall work performed, specifically with regard to the availability of parts when a recall campaign is initiated. The objective of this study was to assess the performance of all activities in the systems of parts supply during recall campaign. Twenty domestic and foreign manufacturers facilities were visited in order to document their parts distribution systems and to document recall campaign specific data pertaining to parts availability. In addition, 141 new car dealerships were visted in 10 NHTSA geographic regions in order to document campaign specific availability of parts at the dealership level. One main observation is that substantial effort by manufacturers is applied to ensure that recall campaigns are successful. The quantities of parts contained in initial shipments appear to be adequate to meet an orderly scheduling of owners for corrective work. The number of campaigns experiencing lateness of parts for initial service under recalls is too large to be written off as an unexplained anomaly. The campaigns with lateness are not more difficult in regard to technical complexity. The repeated examination of the data points to deficiencies in the final stages of distribution of parts to dealers.

Beddow, B Berger, S Ross, D Miller, B
Kappa Systems, Incorporated, National Highway Traffic Safety Administration Final Rpt. HS-806 105, May 1981, v.p., Figs., Tabs.
Contract DTNH22-80-C-01153-01

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: NTIS PB82-218702

367264
A REVIEW OF THE DRIVER-VEHICLE EFFECTIVENESS (DRIVEM) MODEL
This report documents the results of a critical review of the Driver-Vehicle Effectiveness Model (DRIVEM) developed for NHTSA in 1978. An addendum to the report describes changes incorporated into the DRIVEM software to improve its perormance. The DRIVEM computer model is an analytic/simulation tool. It incorporates known data which describe driver performance as influenced by variations in vehicle design, human factors

responses, and driver capabilities in implementing accident-avoidance decisions and evasive actions. The objective of the model is to apply this data so as to produce quantitative estimates of accident probability and severity for specified environmental conditions. Such a tool can be applied to predict the effectiveness of a proposed safety system in reducing the potential for, and/or severity of, auto collisons for a variety of environmental conditions. These environment conditions are defined in terms of "situational scenarios" which represent the initial conditions of a potential accident situation. Following a detailed review of the model, sensitivity tests were conducted to analyze its performance. A workshop was held wherein invited experts in the field assessed the model and rendered conclusions and recommendations. The most prominant of these are: Conclusions: (1) DRIVEM is not acceptable as an evaluative tool at the present time; (2) DRIVEM can become a valuable tool to assess safety standards on a relative or ordinal scale if the model is satisfactorily upgraded; (3) The needed improvements to DRIVEM are technically feasible within its existing framework; the total estimated dollar investment will be in six figures; (4) It will be necessary to gather additional data to complete the DRIVEM data base for calibration purposes. Recommendations: (1) Review and correct the faults embedded in the current analysis/code; identify underlying causes for anomalies revealed by the sensitivity studies; (2) Improve driver scanning (i.e., eye-movement) and event detection models and upgrade the associated data base; (3) Validate the contrast threshold parameters and model; (4) Modify driver-vehicle interaction model so that it is time-dependent.

Lieberman, EB Goldblatt, R

KLD Associates Incorporated, National Highway Traffic Safety Administration Final Rpt. HS-806 110, Nov. 1981, 189p, Figs., Tabs., Apps.
Contract DTNH22-80-C-07082

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: NTIS PB82-218553

367265

TRAFFIC LAW ADJUDICATION. ADMINISTRATOR'S GUIDE

Developed jointly by the American Academy of Judicial Education and the U.S. Department of Transportation, National Highway Traffic Safety Administration, the Traffic Law Adjudication program is designed to inform traffic law judges about current trends and developments and to provide in-depth examination of mainstream issues in traffic law adjudication. Contents of the course range from broad social and emotional issues to specific points of trial law, to highly technical presentations on equipment used in traffic law enforcement and adjudication. This range is intended to present to judges with varying levels of experience a comprehensive program on traffic law enforcement and adjudication processes. The program was tested in a pilot course in Tampa, Florida on December 2-5, 1980, as a joint effort of the Florida State Judicial Education Office and the American Academy of Judicial Education. Forty-nine judges attended this program. Forty-one were members of the Florida Bar. Eight were lay judges. Ages of the attending judges ranged from 32 to 68 years, with the average being 51.3 years. Years of experience on the bench averaged 10.1, with a range of 0 to 33. Because the pilot was aimed at less experienced judges, this profile may not be totally representative of expected participation. However, this audience does provide some example of what can be expected in the diversity of participation. Naturally, the structure of local and state judicial systems will be an influencing factor. This Administrator's Guide is intended for use by that person in charge of each state's judicial education who will have responsibility for implementation of the Traffic Law Adjudication program. It will also serve as a logistical planning and implementation tool for staff appointed to execute and manage Traffic Adjudication program in a local or regional area.

National Highway Traffic Safety Administration HS-806 117, No Date, 95p, Apps.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: National Highway Traffic Safety Administration, 400 7th Street, SW, Washington, D.C., 20590

367266

TRAFFIC LAW ADJUDICATION. INSTRUCTOR'S GUIDE

Developed jointly by the American Academy of Judicial Education and the U.S. Department of Transportation, National Highway Traffic Safety Administration, the Traffic Law Adjudication program is designed to inform traffic law judges about current trends and developments and to provide in-depth examination of mainstream issues in traffic law adjudication. Contents of the course range from broad social and emotional issues to specific points of trail law, to highly technical presentations on equipment used in traffic law enforcement and adjudication. This range is intended to present to judges with varying levels of experience a comprehensive program on traffic law enforcement and adjudication processes. The program was tested in a pilot course in Tampa, Florida on December 2-5, 1980, as a joint effort of the Florida State Judicial Education Office and the American Academy of Judicial Education. Forty-nine judges attended this program. Forty-one were members of the Florida Bar. Eight were lay judges. Ages of the attending judges ranged from 32 to 68 years, with the average being 51.3 years. Years of experience on the bench averaged 10.1, with a range of zero to 33. Because the pilot was aimed at less experienced judges, this profile may not be totally representative of expected participation. However, this audience does provide some example of what can be expected in the diversity of participation. Naturally, the structure of local and state judicial systems will be an influencing factor. This Instructor's Guide is intended for use by the person who teaches this course. It provides a master agenda and detailed instructions on the requirements for each session.

National Highway Traffic Safety Administration HS-806 118, No Date, v.p.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: National Highway Traffic Safety Administration, 400 7th Street, SW, Washington, D.C., 20590

367267

TRAFFIC LAW ADJUDICATION. PARTICIPANT'S GUIDE

Developed jointly by the American Academy of Judicial Education and the U.S. Department of Transportation, National Highway Traffic Safety Administration, the Traffic Law Adjudication program is designed to inform traffic law judges about current trends and developments and to provide in-depth examination of mainstream issues in traffic law adjudication. Contents of the course range from broad social and emotional issues to specific points of trial law, to highly technical presentations on equipment used in traffic law enforcement and adjudication. This range is intended to present to judges with varying levels of experience a comprehensive program on traffic law enforcement and adjudication processes. The program was tested in a pilot course in Tampa, Florida on December 2-5, 1980, as a joint effort of the Florida State Judicial Education Office and the American Academy of Judicial Education. Forty-nine judges attended this program. Forty-one were members of the Florida Bar. Eight were lay judges. Ages of the attending judges ranged from 32 to 68 years, with the average being 51.3 years. Years of experience on the bench averaged 10.1, with a range of zero to 33. Because the pilot was aimed at less experienced judges, this profile may not be totally representative of expected participation. However, this audience does provide some example of what can be expected in the diversity of participation. Naturally, the structure of local and state judicial systems will be an influencing factor. This Participant's Guide is intended for use by each person enrolled in the course. It serves as a textbook, presenting clearly the issues to be discussed and the reference material to be covered in the sessions.

National Highway Traffic Safety Administration HS-806 119, No Date, v.p.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: National Highway Traffic Safety Administration, 400 7th Street, SW, Washington, D.C., 20590

367268

EFFECTIVENESS AND EFFICIENCY OF SAFETY BELT AND CHILD RESTRAINT USAGE PROGRAMS; THE SAFETY POTENTIAL OF SAFETY BELTS, CHILD RESTRAINTS, AND PROGRAMS TO PROMOTE THEIR USE-PROBLEM AND COUNTERMEASURE REVIEW

A review of past studies designed to determine the reasons for low belt usage and of possible approaches for countering such reasons suggests the following considerations to be included in any future efforts to increase safety belt and child restraint usage in the United States: (1) many other groups and organizations have to be involved in the program; (2) automobile deaths and injuries must be viewed as a public health problem; (3) current interest in child restraints should be capitalized on; (4) the economic costs of belt non-use must be better documented; (5) more emphasis on incentive programs should be encouraged; (6) comprehensive, multi-faceted programs should be implemented by "network" of organizations; (7) many different target groups must be addressed; and (8) a program based on voluntary usage is most appropriate at the present time. Such a program is presently being developed by the NHTSA.

Nichols, JL
National Highway Traffic Safety Administration, (NTS 40) HS-806 142, Mar. 1982, 113p, 31 Fig., 163 Ref.

Acknowledgment: National Highway Traffic Safety Administration
Order From: NTIS

367269

PEDESTRIAN INJURY CAUSATION PARAMETERS-PHASE II

This report describes data collection, quality control and data analysis procedures for a five-team program to study pedestrian injury causation factors. The data file contains 1,997 pedestrian accidents collected during a two and one-half year period from September 1977 to March 1980. The report describes the data sources, quality control measures, the data file and the case weighting procedures used in preparing the data for analysis. The study cases represent a sample of the pedestrian accidents occurring in the five collection areas. These samples were compared with the base rate data (all police reported pedestrian accidents) from the areas to determine the representativeness of the sample. Data analysis includes evaluation of injury severity and injury types associated with impact speed, vehicle body style, injury source and pedestrian age. Other analyses include vehicle-pedestrian interactions, pedestrian orientation and injury severity, vehicle braking and injury type and severity and the effect of vehicle geometry on injury. Lower extremity injuries are evaluated in terms of pedestrian age and injury source. Emphasis throughout the analysis is placed on frontal impacts which are the most common. One section is also devoted to vehicle side impacts with pedestrians.

Garrett, JW Baum, AS Parada, LO
Calspan Field Services, Incorporated, National Highway Traffic Safety Administration, (ZS-6117-V-1) Final Rpt. HS-806 148, Oct. 1981, 296p, Figs., Tabs.
Contract DOT-HS-7-01579

Acknowledgment: National Highway Traffic Safety Administration
Order From: NTIS

367270

DRIVER AND PEDESTRIAN SAFETY TECHNOLOGY

This report lists and briefly describes the publications, reports, and other technical materials that the National Highway Traffic Safety Administration (NHTSA) released during Fiscal Years 1980 and 1981 to highway safety-related State and community agencies and support organizations. These Materials were developed as part of NHTSA's program to advance the highway safety state-of-the-art through technical assistance to action agencies. While a small number of the reports deal with advancements yet to be completed, the vast majority present information that can be used by State and local agencies to improve the effectiveness of their accident and injury-severity reduction efforts. The variety of technical programs and the broad spectrum of topics in each program confirm the thesis that lasting safety accomplishments will be attained only through systematic improvements in all programs where deficiencies are identified.

National Highway Traffic Safety Administration HS-806 160, No Date, 15p

Acknowledgment: National Highway Traffic Safety Administration
Order From: National Highway Traffic Safety Administration, 400 7th Street, SW, Washington, D.C., 20590

367271

1980 UNIFORM VEHICLE CODE WORKBOOK. CHAPTER 6. DRIVER'S LICENCES

In the legislative history antecedent to the enactment of the Highway Safety Act of 1966, the Committee on Public Works of the U.S. House of Representatives deplored the "jungle of confusions" and the "vast array of changing and conflicting traffic laws and control systems" as Americans drive from State to State. The point of reference cited in the Congressional hearings for achieving traffic law uniformity was the Uniform Vehicle Code (UVC). The Committee recognized that some States enacted the UVC when it was first published several decades ago but failed for the most part to amend their laws on a systematic basis, concomitant with periodic revisions to the UVC. Revisions to the UVC are essential and in keeping with technological advances in the automotive field, an expanded highway construction program, and the tremendous growth in motor vehicle use. One reason States have failed to keep their driver licensing laws current relative to the UVC may be the lack of a convenient means of law comparison. This new Workbook is designed in a conventional format that will facilitate side-by-side comparisons of each UVC provision and the State law, and may encourage more frequent updating of those laws. The Workbook includes the extensive rearrangements and revisions adopted by the National Committee on Uniform Traffic Laws and Ordinances during recent years, through 1979. The National Committee is the longstanding custodian of the UVC.

National Highway Traffic Safety Administration HS-806 163, Apr. 1982, v.p.

Acknowledgment: National Highway Traffic Safety Administration
Order From: National Highway Traffic Safety Administration, 400 7th Street, SW, Washington, D.C., 20590

367272

PART 581 BUMPER STANDARD. FINAL REGULATORY IMPACT ANALYSIS

The National Highway Traffic Safety Administration has analyzed five alternatives to the present 5 mph bumper standards to determine which alternative, including the current standard, yields the greatest net benefits to consumers as required by statute. The five alternatives included various combinations of 5 mph, 2.5 mph, and unregulated front and rear bumper combinations. In addition, the Agency examined the effects, for each of the above alternatives, of requiring the bumper to protect the vehicle only (known as Phase I protection) or to also sustain only minimal damage itself (known as Phase II protection). After thoroughly considering the data offered by all parties, including bumper suppliers, the Agency has concluded that consumers are assured of the largest amount of net benefits under a standard that requires 2.5 mph protection by both the front and rear bumpers and offers Phase I damage protection. The Agency concludes that the 2.5/2.5 system will yield an additional 28 dollars in net benefits, when compared to the current 5 mph bumpers, to consumers over the life of the vehicle. That results in total consumer savings of approximately 300 million dollars per year. The net 28 dollars in savings is comprised of 93 dollars in vehicle price and fuel savings, offset by an increase of 65 dollars in higher repair costs.

National Highway Traffic Safety Administration HS-806 174, May 1982, v.p., Tabs.

Acknowledgment: National Highway Traffic Safety Administration
Order From: National Highway Traffic Safety Administration, 400 7th Street, SW, Washington, D.C., 20590

367273

REPORT ON TRAFFIC ACCIDENTS AND INJURIES FOR 1979-1980

This is the second report of highway accident statistics using data from the National Accident Sampling System (NASS) The planned size of the annual data base in NASS is approximately 15,000 accidents. The actual numbers obtained in 1979 and 1980 during this initial implementation were 3,424 and 2,973 respectively. The approach taken in this report has been to combine these two files and obtain a larger data base, presenting statistics as an annual average for the 2-year period. As a consequence of the small sample size, the sampling error is large in these data, and the data are inadequate to demonstrate any year-to-year trend information. Therefore, these data should not be the sole basis for any management decision regarding highway safety issues. The 1981 data will include approximately 6,000 accidents and the 1982 data will include over 10,000 accidents.

Comsis Corporation HS-806 176, Feb. 1982, 90p, Tabs., Apps.
Prepared for U.S. Department of Transportation, National Highway Traffic Safety Administration.
Contract DTNH 22-81-C-07617

Acknowledgment: National Highway Traffic Safety Administration
Order From: GPO

367274

THE ROLE ALCOHOL, MARIJUANA AND OTHER DRUGS IN THE ACCIDENTS OF INJURED DRIVERS

A study was conducted of 497 drivers injured in a motor vehicle accident and treated at a hospital. The objectives were to determine the incidence of alcohol and other drugs in their blood systems at the time of the crash and the role these drugs may have played in the accident. The sample was considered conservative with respect to alcohol/drug incidence since only drivers who consented to a blood sample analysis were included. The results showed that fully 38 percent of the drivers had alcohol or some other drug in their systems; alcohol was found in 25 percent, tetrahydrocannabinol in 9.5 percent and tranquilizers in 7.5 percent. Ten percent of the drivers had ingested two or more drugs. It was found that legally intoxicated drivers (BAC greater than or equal to .10 percent) had the highest culpability rate (74 percent) followed by drivers with lower alcohol levels (54 percent) and with THC (53 percent). The drug-free drivers in contrast had a culpability rate of 34 percent while the drivers with tranquilizers were judged culpable in 22 percent of their accidents. Compared with the drug-free drivers, the alcohol-involved drivers were overrepresented in single-vehicle accidents and in the striking vehicles of rearend and head-on crashes. The "alcohol accident type" with the highest incidence (95 percent) of alcohol involvement was a single-vehicle crash between midnight and 6 AM on a curve.

Terhune, KW Fell, JC
Calspan Field Services, Incorporated, National Highway Traffic Safety Administration, (NRD-32) Tech Rpt. HS-806 181, Mar. 1982, 15p, 1 Fig., 7 Tab., 15 Ref.

Paper presented at the 25th Annual Conference of the American Association for Automotive Medicine, San Francisco, California, October 1-3, 1981.Revised March 1982.
Contract DOT-HS-5-01179

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: NTIS

367275

THE EFFECT OF RIGHT-TURN-ON-RED ON PEDESTRIAN AND BICYCLIST ACCIDENTS

Right-Turn-On-Red (RTOR) in its "Western" or "permissive" version allows motorists to turn right on a red signal after stopping unless prohibited by a sign. Many states adopted Western RTOR in the mid-1970's. The objectives of this study were to asess the impact of adopting Western RTOR on the frequency of pedestrian and bicycle crashes with motor vehicles, and to determine the characteristics of any pedestrian and bicycle RTOR accidents. Data from the states of New York, Ohio and Wisconsin and the cities of Los Angeles, California and New Orleans, Louisiana were examined. Time series was the major analytic technique for determining pre/post accident rate changes. Content analyses of police reports provided data on accident characteristics. Measures of pedestrian and bicycle accidents involving a motorist making a right turn at a signalized location increased significantly at all study sites after the adoption of Western RTOR. Estimates of the magnitude of the increases ranged from 48% to 107% for pedestrian accidents and 72% to 123% for bicyclist accidents. Over half of the accidents in which a vehicle turned right at a signalized location after the adoption of Western RTOR involved a right turn on a red signal. These RTOR accidents constituted between 1% and 3% of all pedestrian or bicycle accidents in the studied locations. The majority of these RTOR crashes involved a driver looking left for a gap in traffic and striking a pedestrian or bicyclist coming from the driver's right. Educational countermeasures for bicyclists and pedestrians and traffic engineering approaches, including the further development of warrants for sign prohibitions of RTOR, appear to be worthy of additional research.

Dreusser, DF Leaf, WA DeBartolo, KB Blomberg, RD
Dunlap and Associates, Incorporated, National Highway Traffic Safety Administration, (20/166-01) Final Rpt. ED81-9, HS-806 182, Oct. 1981, 84p, Figs., 11 Tab., 13 Ref., Apps.
Contract DOT-HS-6-01411

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: NTIS

367276

ROLLOVERS AND INJURY ON THE NCSS FILE

Based upon 378 rollover cases on the NCSS file and 2,769 fatal rollover accidents on the FARS file, the following parameters appear to be important in an understanding of injury causation during rollover: (1) Ejection coincides with more injury: However, the contact codes associated with the injuries suggest that occupants are being hurt in the car-i.e., prior to ejection-as well as being hurt outside of the vehicle after ejection. Partial ejection may be more dangerous than total ejection because of the possibility of being crushed between the car and the ground; (2) Roof crush seems related to injury level, perhaps as a measure of the severity of the accident; (3) Intrusion also seems to be a good indicator of the severity of the accident because it is useful in predicting injury; (4) Other variables for which more information is required include: ejection route, injury contact points, and restraint use (by type used); and (5) Variables which do not seem significantly related to injury in rollovers are age (because the occupants tend to be young-under 30), quarter turns and stopping distance (possibly because these are very difficult to estimate), and fire/explosion (the incidence rates are the same for rollovers and non-rollovers).

Partyaka, S (National Center for Statistics and Analysis) Liu, W
National Highway Traffic Safety Administration HS-806 185, Nov. 1978, 26p, 14 Tab.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: National Highway Traffic Safety Administration, 400 7th Street, SW, Washington, D.C., 20590

367277

OCCUPANT PROTECTION PUBLIC INFORMATION MATERIALS CATALOG, NUMBER 4

The Occupant Protection Public Information Materials Catalog is designed for use by persons developing public information programs on restraint systems (adult and child) and motorcycle helmets. It lists materials produced for campaigns, along with journal articles and reports describing and evaluating such programs. Materials and reports listed in the catalog may be borrowed free of charge.

Grimm, AC Huber, KR Fredette, HO
Highway Safety Research Institute, National Highway Traffic Safety Administration Catalog UM-HSRI-82-16, HS-806 202, June 1982, 82p, Refs.
Contract DOT-HS-9-02209

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: NTIS

367278

ALCOHOL/SAFETY PUBLIC INFORMATION MATERIALS CATALOG, NUMBER 6

The Alcohol/Safety Public Information Materials Catalog is designed for use by persons developing public information programs on alcohol and highway safety. It lists materials produced for campaigns along with journal articles and reports describing and evaluating such programs. Materials and reports listed in the catalog may be borrowed free of charge.

Grimm, AC Huber, KR Fredette, HO
Highway Safety Research Institute, National Highway Traffic Safety Administration Catalog UM-HSRI-82-17, HS-806 203, June 1982, 240p, Refs.
Contract DOT-HS-9-02209

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: NTIS

367279

TRANSPORTATION: EVOLVING ISSUES FOR ANALYSIS

This study is based on GAO's current assessment of the major factors affecting the economic viability and efficiency of the U.S. transportation system. Every part of the system, including domestic and international aviation, highways, inland waterways, intercity buses, motor vehicles, ocean shipping, pipelines, rail freight and passenger service, trucking, and urban mass transit, is included in GAO's plan for future audits of Federal programs. The study also emphasizes Congress' interest and concerns, which are reflected by the Federal Governments's expenditures of 24 billion dollars on transportation-related agency programs in 1981.

General Accounting Office CED-82-15, HS-033 049, Jan. 1982, 63p, Apps.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: GAO-Document Handling & Info Services Facility, P.O. Box 6015, Gaithersburg, Maryland, 20760

367280

EFFECT OF BETA BLOCKADE ON DRIVING

During tests of driving performance and kinetic visual acuity (KVA) under the influence of antihypertensive drugs (methyldopa, propranolol, atenolol, and reserpine), a significant improvement in KVA was found with atenolol and deterioration in driving was found with methyldopa and reserpine. Further tests of subjective response using an analogue rating scale revealed an apparently clear anxiolytic effect of atenolol. This was a surprising result as this particular beta-blocking agent is said not to penetrate the brain tissue via the blood/brain barrier. Preliminary results of the effect of atenolol on sleep showed that it reduced the number of changes in level of sleep thereby making it more restful. Atenolol is, therefore, an interesting compound having obvious peripheral but no central effects, but can yet act as an anxiolytic agent and influence the quality of sleep.

Betts, T (Birmingham University, England) *Aviation, Space and Environmental Medicine* Vol. 52 No. 11, HS-033 050, Nov. 1981, pp S40-S45, 6 Fig.

Acknowledgment: National Highway Traffic Safety Administration
Order From: Aerospace Medical Association, Washington National Airport, Washington, D.C., 20001

367281
ROOF-MOUNTED LIGHT SYSTEMS ON POLICE VEHICLES

Tests conducted by several different agencies have indicated that removal of roof-mounted light bars (visabars) from police cars can result in reduced fuel consumption by those vehicles. Analysis of accidents involving patrol units by the California Highway Patrol and the Illinois Department of Law Enforcement have indicated that roof-mounted light bars play no measurable role in reducing accident potential of state police patrol vehicles. Illinois State Police experience further indicates that unmarked units are actually less likely than marked units to incur accidents. For vehicles involved in accidents, the experience of marked and unmarked units is very similar with regard to a variety of factors including type of roadway, lighting conditions, accident severity, activity prior to accident, and whether or not emergency lighting systems were in use. By removing the roof-mounted equipment from the approximately 1000 marked vehicles operated by the Illinois Department of Law Enforcement, fuel costs can be reduced 237,000 dollars a year in terms of current fuel prices. The cost of replacement equipment would be repaid by reduced fuel consumption within four months of conversion. Removal of this equipment would also result in improved vehicle acceleration and greater top speed. Data indicate that no increase in accident rates should result from removal of the visabars.

Stoica, TL
Illinois Department of Law Enforcement HS-033 051, Feb. 1982, 42p, 12 Tab., 20 Ref., 5 App.

Acknowledgment: National Highway Traffic Safety Administration
Order From: Illinois Department of Law Enforcement, Administration Division, Bureau of Planning and Development, Springfield, Illinois

367282
AUTO FUEL FROM PLANTS

This article examines Euphorbia lathyris, the gopher weed, a biennial shrub that grows wild in California, as an alternative source of hydrocarbon fuel. This plant can be cultivated on semiarid land that is not suitable for food crops. To extract fuel the plants are cut, dried in the sun to reduce water content, ground up, and boiled with heptane. The black, sticky oil obtained is then subjected to the cracking process just as crude oil is. It is a little better than crude oil, since no sulfur and no vanadium impurities are present. Current cost estimates are averaged at 100 dollars a barrel. Genetic engineering would boost production. Some foresee a cost of 30 dollars per barrel, which would be very competitive with current crude oil costs. Other plants mentioned in this article are the copaiba of Brazil, milkweeds, and the petroleum nut tree of the Philippines.

Fisher, A *Popular Science* Vol. 220 No. 5, HS-033 052, May 1982, pp 84-85, 1 Phot.

Acknowledgment: National Highway Traffic Safety Administration
Order From: Times Mirror Magazines, Incorporated, 380 Madison Avenue, New York, New York, 10017

367283
ALCOHOL ABUSE IN THE BLACK COMMUNITY

The role that alcohol plays in influencing health and social conditions including accidents, homicides and illnesses is examined. In general, the black community has denied the existence of alcoholism and alcohol abuse, which has created a lack of awareness and commitment in taking action to eliminate alcohol problems. If black Americans are to live healthy, responsible and quality lives, there must be prevention programs aimed at a revision of attitudes and values among Blacks which contribute to alcohol abuse. If these traditional attitudes and values are to be changed, institutions and organizations of the black community will have to take responsibility for educating black people about alcohol and drinking.

Harper, FD (Howard University) Dawkins, MP (Maryland University) *Black Scholar* Vol. 8 No. 6, HS-033 053, Apr. 1977, pp 23-31

Acknowledgment: National Highway Traffic Safety Administration
Order From: Black World Foundation, P.O. Box 908, Sausalito, California, 94965

367284
HIGH-SPEED PERFORMANCE CHARACTERISTICS OF PICKUP TRUCKS

This is tonque in cheek, zany but somewhat empirical sketch about "the world's only beer-guided Motor vehicle" (the pick-up truck) and its driver.

O'Rourke, PJ *Car and Driver* Vol. 27 No. 11, HS-033 056, May 1982, pp 88-92, Phots.

Acknowledgment: National Highway Traffic Safety Administration
Order From: Ziff-Davis Publishing Company, 1 Park Avenue, New York, New York, 10016

367285
DSK 7 TURBO

The DSK 7 is closest in appearance to the S3 version of the Lotus 7. The foundation of this modern 7 is an all-new DSK chassis. Larger or heavier-gauge tubing is used in most areas, along with additional bracing and traingulation where necessary. The individual tubes are hand-fitted and assembled by low-temperature brazing. The floor is a riveted-in-place aluminum sheet. A tray for a battery and a fuel cell is located behind the passenger compartment. The classic flowing fenders are in fiberglass. DSK adds its own front and rear suspension components to this chassis. The brakes are the original Triumph non-vented discs in front and Ford drums in the rear but DSK fits a racing-style, dual-master-cylinder, adjustable-balance-bar arrangement for precise braking adjustments. Fiat-Pirelli 205/60 R-13 P6 tires on six-inch-wide aluminum wheels put the various tractive forces to the ground. The article includes specifications and C/D tests results.

Csere, C *Car and Driver* Vol. 27 No. 11, HS-033 057, May 1982, 4p, Phots.

Acknowledgment: National Highway Traffic Safety Administration
Order From: Ziff-Davis Publishing Company, 1 Park Avenue, New York, New York, 10016

367286
NEW DEVICES

John Dobb, director of the New Devices Section of General Motors, in an interview with the author, describes how his department, established in 1925, handles submissions from inventors. First they must pass an initial screening, and about 85% don't. Those that survive are sent off to the appropriate divisions for a closer look, and if they pass all the tests and are considered valuable to the corporation, then they are forwarded to the patent section which verifies that the inventor has legal rights to the device, and if he does, negotiates to buy those rights, usually on a non-exclusive basis. The legal aspects are also discussed, and then the author interviews an inventor to get his side of the story. In conclusion, some of the needs of the corporation are discussed: new materials, or ways of using existing materials in weight-saving structures, aerodynamics, new methods of mounting glass so that it's flush with the body, and something that could do the job of glass with half the weight.

Bedard, P *Car and Driver* Vol. 27 No. 11, HS-033 058, May 1982, 5p, Figs., Phots.

Submissions should be addressed to: New Devices Section, General Motors Corporation, General Motors Technical Center, Warren, Michigan, 48090

Acknowledgment: National Highway Traffic Safety Administration
Order From: Ziff-Davis Publishing Company, 1 Park Avenue, New York, New York, 10016

367287
FORD ENERGY REPORT. TECHNOLOGICAL ADVANCES IN VEHICLE DESIGN

This special publication is one in a series on Technological Advances in Vehicle Design, and forms part of the Proceedings of the International

Association for Vehicle Design. It covers research and development in the energy field by Ford engineers. The contents have been distilled from many papers, and are presented in a form as readable to the non-expert as to the engineer. Some of the many topics discussed are alternative fuels, electric vehicles, automatic transmissions, lightweight plastic composites high strength steel versus aluminum, electronic fuel injection system, and computer simulation of air drag.

Dorgham, MA, Editor-in-Chief *International Journal of Vehicle Design* SP1, HS-033 059, 1982, 177p, Figs., Tabs., Phots.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: Inderscience Enterprises Limited, La Motte Chambers, St Helier, Jersey, England

367288

THE PUMP

The heart and brain of GM's diesel passenger car power plant is the DB2 fuel-injection pump. This precision pump is responsible for fuel metering, high pressure pumping, injection-timing control, and fuel distribution. This well illustrated article explains how they work and gives troubleshooting procedures. It includes an insert "Good Timing", and a chart" Diesel Fuel-Injection Timing."

Cerullo, B *Motor* Vol. 157 No. 4, HS-033 060, Apr. 1982, 7p, Figs., 1 Tabs., Phots.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: Hearst Books, Motor Books Department, 224 West 57th Street, New York, New York, 10019

367289

NEW RULE

The Metric Conversion Act was signed into law at the end of 1975, with a targeted-but not mandated-10-year adoption period. The lengthy transition time is intended to allow industry to exhaust non-metric inventories and retool metrically. Actually metric measurement is something professional mechanics are already coping with: Ford was the first to introduce metric components on an American passenger car with the 1971 Pinto. This article briefly explains the metric system, includes a metric conversion table, and gives a short review of measurements through the ages.

Robinson, A *Motor* Vol. 157 No. 4, HS-033 061, Apr. 1982, 4p, Tabs., Phots.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: Hearst Books, Motor Books Department, 224 West 57th Street, New York, New York, 10019

367290

EVOLUTION OF THE SERVICE BUSINESS

Cars have become more complex and mechanics will have to learn new skills, new methods, work with new tools and equipment, but there is not going to be a revolution in the service business, and they are not going to be replaced by robots. In this article, service executives from GM, Chrysler, AMC and Ford discuss the many changes they foresee in vehicles of the future, the impact of these changes on mechanics, and what the auto industry is doing to train them and make sure they will be able to handle repairs.

Lund, B *Motor* Vol. 157 No. 4, HS-033 062, Apr. 1982, 5p, Phots.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: Hearst Books, Motor Books Department, 224 West 57th Street, New York, New York, 10019

367291

PEDESTRIAN ACCIDENTS IN THE U.S.

An HSRI team examined human, situational, and vehicle-related factors in pedestrian accidents by analyzing three sets of data: the NHTSA Fatal Accident Reporting System files for 1975-1979; all pedestrian accidents in the state of Michigan for 1976-1979; and all pedestrian accidents in the state of Washington for 1974-1978. Reproduced in this article are 17 of the 61 tables and figures in the final report of the study. Some of the main findings: (1) Young children are disproportionately involved in fatal as well as nonfatal pedestrian accidents; (2) Children are most frequently involved during late afternoon and early evening hours, as are adults over age 60; (3) Young and middle-aged adults are most frequently involved during late evening and early morning hours; (4) Almost two-thirds of the fatal accidents occur after dark; (5) In late-night accidents, prior consumption of alcohol by the driver or pedestrian is a frequent factor; (6) Most pedestrian accidents occur on local urban roads away from intersections; and (7) Heavier types of motor vehicles seem to be disproportionately involved in fatal pedestrian accidents.

Wolfe, AC O'Day, J *HSRI Research Review* Vol. 12 No. 5, HS-033 063, Apr. 1982, 16p, 14 Fig., 3 Tab.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: Highway Safety Research Institute, Huron Parkway and Baxter Road, Ann Arbor, Michigan, 48109

367292

POWERTRAINS AT THE CROSSROADS

Since the Arab oil embargo of October 1973, U.S. automakers, needled by government mileage standards and the public's demand for better fuel economy, have spent billions to develop lightweight cars and pint-size new powertrains, and the results have been dramatic: American cars average fuel economy has jumped 71% between 1977 and 1982. With the price of gasoline dropping back consumers are now interested also in engine performance. Once again, U.S. automakers will have to move quickly to keep abreast of the public's changing expectations as foreign importers are now promoting performance. This article review's Detroit's plans for the future and compares them to those of foreign automakers. The article includes a table on corporate average fuel economy (1977-1982) of U.S., Japanese and European Manufacturers.

Waddell, RL *Ward's Auto World* Vol. 18 No. 4, HS-033 064, Apr. 1982, pp 24-26, Phot.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: Ward's Communications Incorporated, 28 W Adams Street, Detroit, Michigan, 48226

367293

COSTS, BENEFITS AND METHODS OF INCLUDING TIRE INFLATION IN STATE VEHICLE INSPECTION PROGRAMS.

This report presents information to help states include a tire inflation check in their existing and planned emissions, safety and combined safety and emissions insepction programs. It has been estimated that as much as 515 million gallons of gasoline are wasted in the United States each year due to improper tire inflation. Tire inflation if added to a state motor vehicle inspection program would help motorists increase vehicle fuel economy and reduce tire wear as well as improve safety. States adding tire inflation to inspection programs would be able to reduce the effective cost of their programs. Numerous surveys of the tire pressure of vehicles-in-use have shown that many vehicles are being operated with underinflated tires. It is estimated that if a tire pressure inflation program were implemented in State motor vehicle inspection programs a .36 to 2.2 percent fuel economy benefit for the inspected fleet could be achieved depending on the type of inflation program implemented. Tire inflation would have saved each vehicle owner between $3.59 and $13.94 in fuel costs per year. Additionally, correct inflation would increase tire life, resulting in an additional savings of $1.23 to $4.54 per year, as well as improve vehicle safety. If the benefits of improved consumer maintenance practices are considered, a tire inflation program could save motorists as much as $28.72 per year. An examination of available options for implementing a tire inflation check in existing and planned centralized and decentralized inspection programs indicates that (1) the cost per vehicle of adding a tire inflation check would be about 70 cents, and (2) the test could be added relatively easily. Thus the inclusion of a tire inflation check in State vehicle inspection programs is both beneficial and cost effective from the standpoint of the motorist and State. The net savings for the motorist (fuel economy and treadware savings minus additional test cost) could exceed the total test fee of most inspection programs ($5 to $10).

Booz-Allen and Hamilton, Incorporated EPA-460/3-81-022, HS-033 065, Sept. 1981, v.p., 16 Fig., 10 Tab., 39 Ref., Apps.
Contract 68-02-3509

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: NTIS PB82-131137

367295

ACCIDENT ANALYSIS--BREAKAWAY AND NON-BREAKAWAY POLES, INCLUDING SIGN AND LIGHT STANDARDS ALONG HIGHWAYS. PHASE 1 REPORT (METHODOLOGY DEVELOPMENT AND ORGANIZATION)

The complete methodology is summarized for the data collection plan, including sample size and processing of all data, as well as the specific forms to be used for a study on the accident analysis of breakway and nonbreakaway poles for sign and light standards along highways. Also included is an extensive literature review of the state-of-the-art in design and development of luminaire supports, sign supports, and utility poles. Appended are abstracts and references for the state-of-the-art report, a copy of the SAE (Society of Automotive Engineers) J224a Collision Deformation Classification, procedure for application of the Occupant Injury Classification, a preliminary draft of the Abbreviated Injury Scale, dictionaries and field forms, a variable list for vehicle and occupant computer files, and a sample accountability form.

Cromack, JR Mason, RL Swiercinsky, TH Hutchinson, JW
Southwest Research Institute, Kentucky Research Foundation HS-805 380U, 1975, 358p, Refs.
Available as reference copy only. See also HS-805 604, HS-805 606.
Contract DOT-HS-5-01266

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: Southwest Research Institute, 6220 Culebra Road, P.O. Drawer 28510, San Antonio, Texas, 78284

367296

INCREASED D.U.I. (DRIVING UNDER THE INFLUENCE) ENFORCEMENT PROGRAM. ANNUAL REPORT (1ST), JULY 1, 1957-DECEMBER 31, 1975. TECHNICAL SUMMARY

A four-year (1 Jul 1975-30 Jun 1979) Increased D.U.I. (Driving Under the Influence) Enforcement Project granted to the Stockton, Calif., Police Dept., is divided into three phases: planning and development (six months), operation (three years), and analysis and reporting (six months). The project is designed to demonstrate and document the impact of varying levels of DUI enforcement on crashes, on the proportion of drivers with illegal blood alcohol proportions, and on non-traffic offenses, and to determine the cost effectiveness of various levels of enforcement from which an estimated cost/benefit relationship may possibly be derived. The project is designed to reduce the number of alcohol-related vehicle accidents and the proportion of persons driving at illegal blood alcohol concentration (BAC). By using varying levels of saturation enforcement, the project will attempt to determine the number of enforcement personnel needed in each target area. The optimum length of time necessary for impact in each designated target area will also be determined. It is believed that the DUI saturation enforcement techniques will also reduce local street crime due to the high visibility of DUI Traffic Task Force personnel. The enforcement phase, which will last three years from Jan 1976, will be operational on Friday and Saturday nights, days and times identified as being critical from the standpoint of drinking drivers and alcohol-related crashes. Evaluation criteria will include comparisons in the effectiveness of saturation deployment in an experimental area and normal patrol deployment in a control area Friday and Saturday nights, as well as comparative cost-effectiveness determined by apprehension rates, cost of operation, various fines generated by arrests, traffic citations, criminal arrests, and the recovery of property. Cost savings in relation to property damage accidents, injury accidents, fatal accidents, and street crimes, will be determined for benefit/cost relationships. Details are provided for the first phase of the program: assignment of management personnel and planning developments. Subcontracts for evaluation and for updating and revising Stockton's Traffic Records System are described. Development of a detailed budget, choice of two operational areas, and training of personnel are outlined.

Tribble, RE Hannon, R Hause, J
Stockton Police Department HS-805 381U, 1976, 17p
Available as reference copy only. See also HS-805 382U.
Contract DOT-HS-5-01194

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: Stockton Police Department, Stockton, California

367297

INCREASED D.U.I. (DRIVING UNDER THE INFLUENCE) ENFORCEMENT PROGRAM. ANNUAL REPORT (1ST). JULY 1, 1975-DECEMBER 31, 1975.

A four-year (1 Jul 1975-30 Jun 1979) Increased D.U.I. (Driving Under the Influence) Enforcement Project granted to the Stockton, Calif., Police Dept., is divided into three phases: planning and development (six months), operation (three years), and analysis and reporting (six months). The project is designed to demonstrate and document the impact of varying levels of DUI enforcement on crashes, on the proportion of drivers with illegal blood alcohol proportions, and on non-traffic offenses, and to determine the cost effectiveness of various levels of enforcement from which an estimated cost/benefit relationship may possibly be derived. The project is designed to reduce the number of alcohol-related vehicle accidents and the proportion of persons driving at illegal blood alcohol concentration (BAC). By using varying levels of saturation enforcement, the project will attempt to determine the number of enforcement personnel needed in each target area. The optimum length of time necessary for impact in each designated target area will also be determined. It is believed that the DUI saturation enforcement techniques will also reduce local street crime due to the high visibility of DUI Traffic Task Force personnel. The enforcement phase, which will last three years from Jan 1976, will be operational on Friday and Saturday nights, days and times identified as being critical from the standpoint of drinking drivers and alcohol-related crashes. Evaluation criteria will include comparisons in the effectiveness of saturation deployment in an experimental area and normal patrol deployment in a control area Friday and Saturday nights, as well as comparative cost-effectiveness determined by apprehension rates, cost of operation, various fines generated by arrests, traffic citations, criminal arrests, and the recovery of property. Cost savings in relation to property damage accidents, injury accidents, fatal accidents, and street crimes, will be determined for benefit/cost relationships. Details are provided for the first phase of the program: assignment of management personnel and planning developments. Subcontracts for evaluation and for updating and revising Stockton's Traffic Records System are described. Development of a detailed budget, choice of two operational areas, and training of personnel are outlined.

Tribble, RE Hannon, R Hause, J
Stockton Police Department HS-805 382U, 1976, 130p
Available as reference copy only. See also HS-805 381U.
Contract DOT-HS-5-01194

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: Stockton Police Department, Stockton, California

367298

REVIEW AND EVALUATION OF PEDESTRIAN/BICYCLIST SAFETY POLICIES, PROCEDURES, METHODS AND CAPABILITIES. VOL. 1

Findings and conclusions are presented from a study to determine remedial measures to improve some aspects of pedestrian/bicyclist enforcement programs. In addition to 30 on-site visits, efforts were made to obtain copies of regulations, to assess enforcement policies and rationale, to determine enforcement procedures and practices, to point out weak and strong aspects of the programs, and to assess the financial and manpower capability to conduct effective programs. Recommendations appearing most often in site reports concern the lack of basic information related to bicycle/pedestrian experience, especially data summaries, and the lack of data analysis. Also lacking are statements of policy and/or directives for enforcement of bicycle/pedestrian regulations, including violations of these road-users' rights by motorists. Selective enforcement to reduce bicycle/pedestrian accidents is recommended, as well as safety education directed toward parents and school children in high-accident areas and toward drivers who violate bicycle/pedestrian rights. Changes are recommended in organization and/or responsibilities for promoting bicycle/pedestrian safety, including centralized supervision of these activities under one police commander and creation of an enforcement unit. Courts are advised to develop programs (i.e. traffic schools and safety education courses) for correction of violators responsible for bicycle/pedestrian accidents. It is recommended that efforts in bicycle/pedestrian accident reduction be commensurate with the severity of the local problem. No change is suggested for activities of highway and state patrols. Fifteen site visit reports are included.

International Association of Chiefs of Police, Inc HS-805 383U, 1974, 366p, Refs.

Available as reference copy only. Vol. 2 is HS-805 384U.
Contract DOT-HS-4-00875

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: International Association of Chiefs of Police, Inc, 11 Firstfield Road, Gaithersburg, Maryland, 20760

367299

REVIEW AND EVALUATION OF PEDESTRIAN/BICYCLIST POLICIES, PROCEDURES, METHODS AND CAPABILITIES. VOL. 2

Fifteen site reports are presented from a study to determine remedial measures for improving some aspects of pedestrian/bicyclist enforcement programs.

International Association of Chiefs of Police, Inc HS-805 384U, 1974, 347p, Refs.

Available as reference copy only. Vol. 1 is HS-805 383U.
Contract DOT-HS-4-00875

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: International Association of Chiefs of Police, Inc, 11 Firstfield Road, Gaithersburg, Maryland, 20760

367300

RECOMMENDED SPECIFICATIONS FOR RESEARCH SAFETY VEHICLE (RSV). INTERIM TECHNICAL REPORT

Vehicle specifications are presented which are considered suitable for a vehicle introduced in the mid-1980's. These are based upon the results of an earlier study which defined characteristics suitable for a vehicle for this time period. Attention is focussed on overall costs of highway safety in relation to both social loss and vehicle costs, the priorities necessary for improving crashworthiness, and test methodology appropriate for the Research Safety Vehicle (RSV). In recognition of the eventual development of a producible automobile, an approach which would upgrade a production car to the RSV specifications is recommended. A suitable production vehicle and its more important features relevant to the RSV specifications have been identified under the following categories: dimensions, safety performance (vehicle handling and stability, visibility, driver environment and crash energy management systems, and occupant compartment specifications), vehicle systems (cooling, exhaust, electrical, and maintenance) and producibility. Appended are crash injury reduction test conditions.

Miller, PM DuWaldt, FA Pugliese, SM Ryder, MO, Jr
Calspan Corporation ZN-5450-V-2, HS-805 385U, 1974, 349p, 110 Ref.
Available as reference copy only.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: Calspan Corporation, Transportation Research Department, 4455 Genesee Street, Buffalo, New York, 14221

367301

REVIEW OF THE LITERATURE RELATING TO THE EFFECTIVENESS OF BREATH TESTS AND PRE-ARREST SCREENING TESTS AS ENFORCEMENT TOOLS. ALCOHOL BIBLIOGRAPHY AND FILE. TASK 3 REPORT

A review (with abstracts) is presented of literature concerning the effectiveness of the breath test in accurately measuring blood alcohol level, and utilization of the breath test as an effective law enforcement tool in removing drunk drivers from the roads and highways. Also considered is the breath test's effectiveness as a screening and pre-arrest tool. The effective application of the breath test as a law enforcement tool has often been impaired by doubts as to the accuracy and specificity of breath test instrumentation, as well as by legal issues concerned with constitutionality and associated "implied consent" statutes. The possibility of being found guilty of false arrest has placed the arresting officer in a vulnerable position, undermining his confidence in the use of breath tests. Improved reliability and accuracy of instrumentation, along with new and reinterpreted legislation, is surmounting some of the cited obstacles and is leading to increased use of the tests as enforcement tools.

Information Planning Associates Incorporated HS-805 386U, 1972, 93p, Refs.

Available as reference copy only. Task 1 is HS-803 448; Task 2 is HS-803 449; Task 4 is HS-803 450; Task 6 is HS-803 451; Thesaurus is HS-803 447.
Contract DOT-HS-250-2-496

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: Information Planning Associates Incorporated, 310 Maple Drive, Rockville, Maryland, 20850

367302

THE JOINT INDUSTRY-GOVERNMENT VOLUNTARY TRUCK AND BUS FUEL ECONOMY PROGRAM

The Voluntary Truck and Bus Fuel Economy Improvement Program, begun in 1975, emphasizes the need for shared responsibility by the Government, manufacturers, and motor carriers. Program membership now includes over 300 actively participating manufacturers, suppliers, motor carriers, trade associatons, labor organizations, trade press, and government agencies. The Society of Automotive Engineers (SAE) developed consensus standard test procedures for measurement of truck and bus fuel economy. A test fleet of trucks and trailers built to SAE specifications with a "fuel-saver" were tested by different motor carriers in various geographical areas. Information on efforts to save fuel and results obtained was collected from leading manufacturers and distributed through members by a nation-wide system of pamphlets and brochures. Recommended practices were studied in the areas of vehicle categorization; driving cycles; OEM test procedure; in-service and aerodynamic test procedures; test procedures for engine, fan, and accessory, driveline components, and rolling resistance; and vehicle simulation. Excess engine idling was found to be a large factor in fuel consumption; a three-day test for fuel consumption vs. speed showed generally better fuel economy at 55 mph than at higher speeds. It is estimated that in 1979 the truck program produced twice the savings of the legislated automobile regulations. Industry has invested over $900 million on fuel-saving options on new trucks. Cost of this successful voluntary program has been 1/10th cent per gallon of fuel saved, far less than any regulatory program would have cost.

National Highway Traffic Safety Administration HS-805 449, 1980, 13p

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: National Highway Traffic Safety Administration, 400 7th Street, SW, Washington, D.C., 20590

367303

RESULTS OF ROLLING RESISTANCE MEASUREMENTS ON TWELVE RADIAL PASSENGER CAR TIRES. FINAL REPORT

The Calspan Tire Research Facility is described, including the test procedure, a tire test schedule, and a tire identification schedule for testing low-rolling resistance radial passenger car tires. The equilibrium rolling resistance was measured on each of the following 12 tires: four Goodyear elliptical P215/65 R390, four Uniroyal P185/80 R13, and four Firestone P195/75 R14. Tires were maintained in free-rolling, straight-ahead conditions, and tire inflation pressures were regulated during the tests. The results of force and moment measurements are reported in graphs and tables.

Brown, C
Calspan Corporation DOT-TSC-NHTSA-80-8, HS-805 451, 1980, 134p, 3 Ref.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: NTIS

367304

FUNCTIONAL ASPECTS OF DRIVER IMPAIRMENT. A GUIDE FOR STATE MEDICAL ADVISORY BOARDS

A guide is provided for use by medical advisory boards in advising the driver licensing agency on medical criteria and vision standards. After a discussion of medical classifications for driver licensure, and evaluation of conditions that impair functional capability to operate a motor vehicle, the manual considers neurological disorders, cardiovascular diseases, metabolic conditions, alcohol and other drug abuse, mental illness, musculoskeletal conditions, respiratory function, problems of vision and hearing, narcolepsy, obesity and vestibular disorder, and the aging process. Physician reporting of driver impairment and medical standards for safety belt usage are discussed. Appended are a schematic of the American Association of Motor Vehicle Administrators classified program; a list of the physical qualifications for drivers of motor carriers engaged in interstate or foreign commerce; a definition of the problem drinker; and an excerpt from the Uniform Vehicle Code.

Highway Safety Literature

American Association of Motor Vehicle Admin HS-805 460, 1980, 73p, 57 Ref.

Guidelines for Motor Vehicle Administrators Series. Sponsored by National Highway Traffic Safety Administration.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: GPO 050-003-00348-4

367305

AUTOMOBILE OCCUPANT CRASH PROTECTION. PROGRESS REPORT NO. 3

Considered in this progress report are human loss in motor vehicle crashes; the technology of occupant protection; Federal Motor Vehicle Safety Standard (FMVSS) 208, Occupant Crash Protection; industry plans for implementing FMVSS 208; and public acceptance of automatic crash protection. Annual human loss in motor vehicle crashes of 50,000 deaths and four million injuries, and monetary cost of $50 billion do not reflect hidden personal costs, trauma and heartbreak suffered by individuals and their friends and relatives. The science of vehicle crashworthiness has progressed to the point where engineers can design crashworthiness into safety glass and padding and into the car body structure as well. Regulations of the National Highway Traffic Safety Administration set minimum requirements for occupant protection at 30 mph in frontal crashes. Systems meeting these requirements reduce a person's risk of death or serious injury in a severe crash by nearly 50%. The shift to small cars and the growth in automobile use may cause 15,000 more people to be killed each year by 1990 if automatic crash protection is not instituted. FMVSS 208 requires that, by model year 1983, all new intermediate and compact cars must be equipped with automatic restraint systems in the front seats, and by model year 1984 the standard will be extended to all new passenger cars. Mercedes-Benz has decided to build its 1982 U.S. models with air bags as standard equipment for protecting front-seat occupants. Ford plans to make air bags available as an option in limited numbers in the 1981 model year. General Motors has changed its plans to offer the choice of air bags for automatic crash protection in 1982 models. This decision will save the company about $20 million in capital investments. All domestic manufacturers are planning to comply with FMVSS 208, and two are currently manufacturing cars for sale with an automatic belt system (Volkswagen Rabbit and General Motors Chevette). Most foreign car manufacturers exporting cars to the United States are also planning to produce cars with automatic restraints. Public acceptance of automatc crash protection is good, even though air bags add $360 to the price of a new car. Developments in automatic and manual safety belts, air bags, and crash protection for children are reviewed. Evaluation of automatic crash protection is discussed. A list of materials on occupant restraints and a list of domestic manufacturers of safety components are appended.

National Highway Traffic Safety Administration HS-805 474, 1980, 100p, Ref.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: National Highway Traffic Safety Administration, 400 7th Street, SW, Washington, D.C., 20590

367306

DRIVER LICENSING. A REPORT TO THE SECRETARY OF TRANSPORTATION BY THE NATIONAL HIGHWAY SAFETY ADVISORY COMMITTEE

In a study of U.S. driver licensing (question and answer format), much diversity was found in the criteria used by the states to qualify drivers, revoke licenses, identify problem drivers, and record violations and accidents in a driver's record. It is recommended that extensive research be conducted to develop an effective model comprehensive driver licensing and revocation program and that the program be used to effect a national approach to driver licensing and revocation, with emphasis on complete interstate cooperation.

National Highway Safety Advisory Committee, NHTSA HS-805 475, 1980, 11p, 5 Ref.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: National Highway Safety Advisory Committee, NHTSA, Task Force on Driver Licensing, 400 7th Street, SW, Washington, D.C., 20590

367307

INCOMPATIBILITY OF STANDARDS USED IN: QUALIFYING DRIVERS, BUILDING HIGHWAYS, DESIGNING VEHICLES. A REPORT TO THE SECRETARY OF TRANSPORTATION, JUNE 17, 1980

Many situations exist which establish expectations beyond the normal functional capabilities of even the most alert and physically fit driver. As long as crashes resulting from highway safety standards incompatible with normal driver performance are attributed to "driver error", no effort will be made to improve the situation. With the increased vehicle population of small cars, the problem of incompatibility has become more serious. It is recommended that the Secretary of Transportation adopt a five-part program to effect compatibility and thus improve safety. All standards, guidelines, and regulations affecting highway safety which are issued or endorsed by the Department of Transportation (DOT) should be reviewed for compatibility. A plan should be developed to resolve incompatibilities which will consider the driver and the projected vehicle population. Automakers should be urged and assisted in voluntarily resolving incompatibilities between their own vehicles and with highway safety hardware. DOT should take the lead to ensure compatibility of standards sponsored by government and by public organizations engaged in setting standards. A process should be implemented to ensure that future safety standards and regulations are coordinated and reviewed for compatibility.

National Highway Safety Advisory Committee, NHTSA HS-805 476, 1980, 16p, 6 Ref.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: NTIS

367308

VOLUNTARY COMPLIANCE WITH THE 55 MPH NATIONAL SPEED LIMIT. A REPORT TO THE SECRETARY OF TRANSPORTATION BY THE NATIONAL HIGHWAY SAFETY ADVISORY COMMITTEE

Findings and recommendations are reported from a study which explored ways to increase voluntary compliance with the fifty-five mile per hour speed limit. Reasons for noncompliance include commercial vehicle drivers setting a faster pace for all traffic, unrealistic goals and criteria of the 55 legislation/regulations, ineffective sanctioning system for 55 violators, and lack of involvement by state officials. Recommendations to the states include more active participation by state leaders in the enforcement and compliance program; establishment of a system for notifying commercial vehicle owners of drivers' speeding citations; adoption of the Driver License Compact (one license concept); an enforcement system incorporating significant fines for violators, accurate recording of violations on drivers' records, and judicial accountability of all traffic violations; use of radar, including equipment standards, operator training, and procedural guidelines; and aerial surveillance in enforcement. A communications network linking all licensing jurisdictions with each other and with a national register of problem drivers is recommended, as well as research to define a model driver record system. More intensive news coverage of all increased 55 mph enforcement efforts should be sought and commercial endorsements by celebrities avoided. It is recommended that the Department of Transportation consider speeds of 55-60 mph as meeting the 55 mph speed limit.

National Highway Safety Advisory Committee, NHTSA HS-805 484, 1980, 20p, 14 Ref.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: National Highway Traffic Safety Administration, 400 7th Street, SW, Washington, D.C., 20590

367309

SAFETY RELATED RECALL CAMPAIGNS FOR MOTOR VEHICLES AND MOTOR VEHICLE EQUIPMENT INCLUDING TIRES, REPORTED TO THE NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION BY DOMESTIC AND FOREIGN VEHICLE MANUFACTURERS, APRIL 1, 1980 TO JUNE 30, 1980.

Following a summary tabulation of safety defect recall campaigns, information is provided on foreign and domestic motor vehicle and equipment recall campaigns including the NHTSA identification number, date of company notification, make and model (or size designation), model year, number of pages on file, number of vehicles or components recalled, and a brief description of the defect and the manufacturer's corrective action. Types of vehicles recalled include passenger cars, vans, trucks, motorcycles and mopeds, semi-trailers and trailers, street sweepers, buses semi-trailers and trailers, street sweepers, buses (including wheelchair lifts), school buses, motor homes, and travel trailers. Equipment under recall includes tires, power take-offs, brake fluid, fuel filters, motorcycle rear brake master cylinder assemblies, wheels, windshields, and combination rear lamps.

National Highway Traffic Safety Administration HS-805 495, 1980, 18p

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: GPO

367310

THE CONTRIBUTIONS OF AUTOMOBILE REGULATION

Statements by the automotive industry and others that the industry is overregulated and economically harmed by Federal directives are evaluated. Critics of government intervention claim that regulations impede growth, stifle innovation, increase unemployment, and hamper the industry's ability to compete internationally. Regulatory agencies have been criticized for attempting to limit the free choice of consumers and have been characterized as being unresponsive, ineffective, and unreasonable. In analyzing beneficial effects of rulemaking by the National Highway Traffic Safety Administration to the industry, consumers, and the economy, it is contended that the agency's responsibility to improve safety is warranted by the annual loss of 50,000 lives and the many injuries in motor vehicle crashes. The economic loss to society because of these accidents is estimated at more that $50 billion, pointing to the need for a "socially responsible" automobile. Due to Federal fuel economy standards, the country may be able to decrease its reliance on foreign oil sources. Both safety standards and fuel economy regulations create challenges to the industry's technological potential, and they promote competition by requiring compliance with uniform performance. The increasing number of vehicle recalls because of safety defects may illustrate the automobile industry's failure to provide maximum safety. Profitability and sales in the industry are largely a function of the economy rather than the effect of regulation. The financial health of individual companies is primarily due to prior corporate strategies, and competition has not and need not be significantly affected by government directives. The cost of safety features on motor vehicles is not exorbitant, and fuel savings over the vehicle's life more than offset safety-related expenditures.

National Highway Traffic Safety Administration HS-805 501, 1979, 60p

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: National Highway Traffic Safety Administration, 400 7th Street, SW, Washington, D.C., 20590

367311

SAFETY CONSEQUENCES OF THE SHIFT TO SMALL CARS IN THE 1980'S

The number of motor vehicle occupant fatalities, now at 35,000 annually, has increased for the past five years; and the growing shift to small cars is adding to the traffic safety problem. Small cars are less safe because they are subjected to greater forces in collisions with larger, heavier vehicles. As demonstrated by the Research Safety Vehicle Program, automakers can readily design small cars incorporating improved safety at minimal costs. Vehicle design improvements can increase the likelihood of surviving a crash without serious injury, including crash energy management (to absorb, control, and reduce crash forces on the occupants via improved structural design); improved structural integrity (to prevent occupants from being ejected, trapped, burned, or crushed by the steering column or by compartment collapse); and occupant restraints (to prevent or cushion the second collisions of the occupant with the vehicle interior). If the Federal standard for automatic crash protection (air bags and automatic seat belts) is implemented on schedule, it is estimated that between 10,500 and 13,600 lives will be saved in 1990 and nearly 250,000 by 2000. To provide protection in side impacts, a planned crash protection standard covers strengthened and padded doors and door frames, and redesigned window glazing and seat structure.

Boehly, WA Lombardo, LV
National Highway Traffic Safety Administration HS-805 506, 1980, 27p, Refs.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: National Highway Traffic Safety Administration, 400 7th Street, SW, Washington, D.C., 20590

367312

IMPLICATIONS OF THE NEW CAR ASSESSMENT PROGRAM FOR SMALL CAR SAFETY

The New Car Assessment Program (NCAP), initiated by the National Highway Traffic Safety Administration (NHTSA) in 1979, is designed to explore the feasibility of establishing a comparative crashworthiness rating system for new cars. Initial experimental work by NCAP has used the injury criteria of Federal Motor Vehicle Safety Standard (FMVSS) 208 (occupant crash protection) and requirements of other standards for 30 mph barrier test performance (FMVSS's 212 and 219, windshield retention and intrusion; and FMVSS 301-75, fuel leakage). The tests have involved single crashes of a small number of minicompact, compact, and intermediate class cars for model years 1979 and 1980. This crash test work, although not a rating system per se, has provided a substantial amount of data for the comparative assessment of safety performance. The results indicate that there are significant differences in performance among cars of similar weight, the differences among vehicles generally falling into three categories: vehicle structure, steering column performance, and restraint system performance. Based on engineering evaluations, the costs for remedial measures would not exceed 15 dollars. Since there is good presumptive evidence that consumers would use the rating system in purchase decisions, NHTSA plans to pursue rulemaking which would make this type of safety information routinely available for a large number of automobiles.

Brownlee, M Hackney, J Abney, T
National Highway Traffic Safety Administration HS-805 510, 1980, 13p, 6 Ref.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: National Highway Traffic Safety Administration, 400 7th Street, SW, Washington, D.C., 20590

367313

MOBILE DIAGNOSTIC INSPECTION OF MOTOR VEHICLES

The development of a mobile system for the diagnostic inspection of motor vehicles is described. Objectives of the mobile service include customer convenience, low cost to customers, employee benefit, and reduced accidents, fuel waste, emissions, noise, and costs for inspection, maintenance and repair. System design is discussed in terms of varieties of mobile facilities, operational designs, and program possibilities (employee car care, fleet maintenance, individual vehicle inspection and maintenance, garage network, and servicing option for leased vehicles). Vehicle and equipment requirements, their estimated cost, and van layouts are given, as well as personnel needs. Inspection workload (throughput and levels, including a subcategory listing of components/ elements/conditions) and cost of inspections (number of inspections, annual cost factors, and cost per inspection) are indicated. The report focuses primarily on the concepts, either implemented or planned, of the United Systems Testing, Inc. mobile diagnostic inspection/maintenance/repair operation in the St. Louis, Missouri area.

National Highway Traffic Safety Administration HS-805 514, 1980, 23p

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: National Highway Traffic Safety Administration, 400 7th Street, SW, Washington, D.C., 20590

367314

PASSENGER VEHICLE TIRE INSPECTION EQUIPMENT. SERVICE MANUAL, OPERATION AND MAINTENANCE. FINAL REPORT

A manual is provided for a prototype tire testing machine designed for use in an autmated vehicle inspection facility. After adjusting the cold inflation pressure of the tire to the correct value, the device inspects the tire carcass for structural integrity. The tire pressure adjustment is accomplished by sampling the pressure and temperature of the tire, computing the required change, and inflating or deflating the tire as necessary. Carcass integrity is determined by exciting the tire with a random forcing function generated by an electromechanical shaker, and comparing sidewall responses as measured by sensors on opposite sides of the tire. Two test stands accommodate the mechanisms necessary to position the shakers and sensors and to rotate the tire during a test. A keyboard located on the front of a control console provides communication with a microcomputer which is responsible for system control. The tire testing machine is described, as well as its operation (and theory of operation) and installation and maintenance procedures. The operating software is also described. Appended are a software flow chart, a software listing, and part and assembly drawings.

Johnson, JE Charbonnet, CR Wood, CM
Southwest Research Institute SWRI-02-5080, HS-805 517, 1979, 229p
See also HS-805 515 and HS-805 516
Contract DOT-HS-7-01693

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: NTIS

367315

THE NATIONAL DRIVER REGISTER: A PART OF THE STATES DRIVER LICENSING SYSTEM. A REPORT TO THE CONGRESS

The need for and practicability of a national driver register to improve the integrity of the states' driver licensing programs are addressed. Six alternative system configurations are studied, including their cost and potential impact on the total driver licensing management system. Three indexing systems are considered which duplicate state data files maintained at the national level: Batch/Mail, Rapid Response, and HR 11733. Three pointer systems are considered which have only minimal data maintained at the national level, the substantive data held by the states: Problem Driver, All Driver, and Phased-In All Driver. The study concludes that a National Driver Register system is needed to determine (through a single inquiry) if a person has a past record of poor driving practices in other jurisdictions. Other reasons for such a system include: to reduce serious traffic law violations; to provide states with complete and accurate driver records to carry out their licensing responsibilities, and accessibility to problem driver records regardless of location; to enable employees to obtain their comprehensive driver history records for employment purposes; to support the Driver License Compact and the one-license/one-record concept; to provide the Department of Transportation and National Safety Board with driver data for research and accident investigations; and to support Federal Highway Safety Program Standard No. 5 (Driver Licensing) and No. 10 (Traffic Records). The Problem Driver Pointer System is recommended for implementation as the least costly and most cost-effective of the alternatives reviewed.

National Highway Traffic Safety Administration HS-805 527, 1980, 307p, Refs.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: National Highway Traffic Safety Administration, 400 7th Street, SW, Washington, D.C., 20590

367616

RECOVERY AND DRIVING AFTER BRIEF ANAESTHESIA

It seems clear that patients should always be escorted when leaving the hospital after brief anaesthesia. The length of hospital stay should be based on the patient's test performance as well as on the supposed effects of the drugs on psychomotor performance. Minimal requirements for safe discharge should, in addition to stable vital signs and the ability to maintain oral fluids, include that patients are able to dress themselves and able to walk out. Recommendations not to drive should be based on the extent of the impairment of performance when assessed at the hospital, as well as on documented objective knowledge of the residual effects of the drugs used. In most cases patients should refrain from driving for at least 24 hours after anaesthesia.

Korttila, K (Helsinki University of Technology, Finland) *Anaesthesist* Vol. 30 No. 8, HS-033 071, July 1981, pp 377-382, 71 Ref.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: Springer Verlag, 175 Fifth Avenue, New York, New York, 10010

367617

SENIOR DRIVER FACTS

The relationship between aging and driver performance has been a widely debated topic for many years among researchers and licensing administrators. This issue has particular significance for California, which has the largest number of senior citizens in the nation and comparatively stringent examining standards. In a study on the aged driver, Planek et al. (1968) reported that the aged driver does not always perceive his driving problems at the appropriate level of importance relative to accident risks. His main problems involve interaction with overall traffic flow around him and performance in changing lanes, turning, passing and backing. He is also known to have perceptual-motor problems related to stimulus overload and the necessity for rapid reaction and decision making. The problems of the aging driver are taking on greater importance as the length of life increases, and earlier retirement gives the elderly more time to travel, socialize, and seek recreation.

California State Department of Motor Vehicles CAL-DMV-RSS-82-82, HS-033 073, Jan. 1982, 5p, 2 Fig., 4 Tab., 3 Ref.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: California State Department of Motor Vehicles, P.O. Box 11828, 2415 1st Ave, Res and Dev Office, Sacramento, California, 95813

367618

THE CHARACTERIZATION OF AUTO HEADLIGHT GLASS BY REFRACTIVE INDEX AND DENSITY

This study was designed to evaluate the potential usefulness of measurements of refractive index (RI) and/or density of automotive headlight glass for forensic purposes. Automotive headlights were obtained from several sources. As of the time the analytic work was performed, it appeared that there were three subpopulations of headlight glass: General Electric (GE), Corning manufactured before 1971, and Corning manufactured after 1971. The distributions of RI (and density) for the first two subpopulations overlapped considerably, so that one could not reliably determine to which of these a candidate piece of glass belonged. However, the latter population was different enough that one could reliably classify a fragment as belonging either to one of the first two or to the third. Furthermore, since headlights on the road at that time were about equally split between the three groups, the performance of both RI and density for individualization (i.e., the matching of an unknown fragment with a specific lens) was evaluated using the fact of an even split. Since the analytical work was done, the composition of glass has been changed several times by both manufacturers (and a significant number of lenses not made in the United States have appeared on the road). Without another comprehensive sampling of lenses, it is not possible to know how different the lenses on the road today really are. However, one may obtain a conservative figure by acting as though there is only one population, and this is done in section 9 (which updates the report to January 1981).

National Bureau of Standards, Department of Justice Final Rpt. NBSIR 81-2286, HS-033 074, Oct. 1981, 37p

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: NTIS PB82-131723

367619

PRODUCING MORE FUEL-EFFICIENT AUTOMOBILES: A COSTLY PROPOSITION

Legislation establishing Federal fuel economy standards for automobiles required the auto industry to produce new-car fleets that averaged 18 miles per gallon starting with model year 1978, increasing to 27.5 miles per gallon by 1985. Industry expects to spend about $70 billion (in constant 1980 dollars) on buildings, property, equipment, and retooling over the next several years to produce new, small, fuel-efficient autos that will compete with foreign imports. Comparable expenditures for the pre-fuel economy period of 1970-74 were $35 billion, and in the initial fuel economy period of 1975-79, they were $41 billion. The industry expects that it will attain fleet averages of about 31 miles per gallon by 1985. Market demand for more fuel-efficient cars coupled with foreign competition will probably lead the auto industry to keep on producing fuel-efficient automobiles for the future. Although existing technologies can approach a fleet average of 40 miles per gallon and beyond, the major uncertainty concerning the production of such automobiles appears to be the risk of financing the large capital investments needed.

General Accounting Office CED-82-14, HS-033 075, Jan. 1982, 36p, 7 Fig., 8 App.

Report to the Chairman, Committee On Energy and Commerce, House of Representatives of the United States.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: GAO-Document Handling & Info Services Facility, P.O. Box 6015, Gaithersburg, Maryland, 20760

367620

A GUIDEBOOK FOR PLANNING ALCOHOL PREVENTION PROGRAMS WITH BLACK YOUTH

This publication contains ideas on starting programs to prevent alcohol abuse among black youth. Described are the beginning steps--mobilizing interested groups, getting multiple agency support through networking, finding out what youth/alcohol issues are of concern to the individual community, writing a grant proposal, getting funding support, holding a prevention workshop--and the most critical step of involving youth as partners in programs that encourage independent decisionmaking about alcohol. This Guide recognizes that (1) blacks, like other minorities, are not just nonwhite, but exist in a unique social and psychological context that shapes attitudes, values, and behaviors, and (2) each minority community has its own singular set of needs and problems and must assess its own problems and enlist its own resources to meet these needs. Each chapter begins with

National Institute on Alcohol Abuse DHHS (ADM) 81-1055, HS-033 076, 1981, 134p, Figs., Phots., Refs., Apps.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: GPO

367621

TROUBLE SHOOTING FORD'S MICROCOMPUTER CONTROL UNIT, PART 2

Part 1 of this 2-part article outlined which engines have the microcomputer control unit (MCU) and contained a chart listing its parts. This chart is necessary to perform the diagnostic tests explained in the present article. The purpose of troubleshooting the MCU is to determine if a part of the system is causing poor engine performance. To do so, one of two instruments is needed: the Self-Test Automatic Readout (STAR) unit, or an analog voltmeter. This article reviews how to use both instruments in 2.3-liter engines, 4.9-liter engines and V8 engines.

Schultz, M *Popular Mechanics* Vol. 157 No. 6, HS-033 077, June 1982, pp 35-38, Figs., Phots.

See also Troubleshooting Ford's Microcomputer Control Unit, Part 1, Popular Mechanics, April 1982, HS-033 037, TRIS 367112.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: Hearst Magazines, 224 West 57th Street, New York, New York, 10019

367622

CONSPICUITY BUS HELPS CURE POOR BUS VISIBILITY

This article describes a "Conspicuity Bus" package developed by Weldon, Inc. which greatly increases the "attention attractiveness" of a school bus during dusk and night time visibility conditions. This Weldon 2000 series Conspicuity Lighting Package meets the requirements of FMVSS 108 and can be installed by the body builder in compliance with this standard. In additon, a Conspiciuity Reflector Package is described. These reflectors are designed to perform a highly efficient reflector function under headlight conditions and hazardous low light environments.

School Bus Fleet Vol. 27 No. 2, HS-033 078, May 1982, pp 26-28, Figs., Phots.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: Bobit Publishing Company, 2500 Artesia Boulevard, Redondo Beach, California, 90278

367623

BRAKE CONTROL CHOICE

This short article reviews the different types of controllers which are used with electric trailer brakes. The purpose of a trailer brake controller is to synchronize trailer brake actuation with tow vehicle brake actuation as closely as possible. Trailer stability can be affected by independent use of trailer brakes and this is where the controller choice affects how the trailer brakes are used. All units are automatic, but some offer the driver a manual over-ride which is very useful at times for sway-damping.

Estes, B *Trailer Life* Vol. 42 No. 6, HS-033 079, June 1982, pp 135-136

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: Trailer Life Publishing Company Incorporated, 23945 Craftsman Road, Calabasas, California, 92132

367624

DEATH AND INJURY FROM MOTOR VEHICLE CRASHES IN ISRAEL: EPIDEMIOLOGY, PREVENTION AND CONTROL

Death and motor vehicle crash (MVC) rates per 1000 vehicles and kilometres travelled in Israel (1977) exceed those of all western countries, despite low numbers of young and intoxicated drivers. Increased casualties have resulted from expansion of driver and vehicle populations offsetting a decline in crash risk. Time data indicate casualty crash trends reflect trends in traffic volume, and that night time case fatality rates (CFR) are high. Place data indicate that more than three quarters of all crashes occur in cities, mostly involving pedestrians, but the majority of deaths result from higher speed inter-urban crashes, mostly of 2-vehicle type, and not at intersections. The rates for deaths per 100 crashes are 4-and 8-fold higher in inter-urban than urban crashes for occupants and pedestrians, respectively. Vehicle data indicate high MVC risk from careless driving, probably speeding in taxis, and point to the need for occupant protection standards in lightweight trucks and pickup vans. Human data indicate that 92% of drivers in MVCs are male. The risk of involvement is high for drivers aged 18 and drops at age 55. Pedestrian accidents resulted in 48.1% of all dead, and included large numbers of young and elderly. Reduction in inter-urban private motor vehicle travel and in speeds at which crashes occur are suggested as swift and effective measures to reduce death and injury. Low cost strategies include air bags and other occupant protection standards and more seat belts. Prevention of pedestrian accidents requires a variety of measures to reduce vehicle-pedestrian conflicts.

Richter, ED (Hebrew University, Jerusalem) *International Journal of Epidemiology* Vol. 10 No. 2, HS-033 080, 1981, pp 145-153, 9 Fig., 2 Tab., 29 Ref.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: Oxford University Press, Press Road, Neasden, London NW10 0DD, England

367625

DRUGS AND DRIVING. NO MYTH ABOUT THIS MEDUSA

This article presents a brief summary for each of the following drugs regarding their effects as they may relate to driving: barbituates, tranquilizers, alcohol, marijuana, amphetamines, cocaine, caffeine, narcotics, hallucinogens, over-the-counter medications, and antihistamines.

Driver Vol. 15 No. 11, HS-033 081, Apr. 1982, 7p, Figs., Phots.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: US Air Force Inspection and Safety Center, Norton AFB, California, 92409

367626

EFFECTS OF CHRONIC BETA-BLOCKADE ON INTRA-ARTERIAL BLOOD PRESSURE DURING MOTOR CAR DRIVING

Continuous intra-arterial blood pressure recordings during motor car driving were performed in 15 patients with untreated essential hypertension, using the "Oxford" recording technique. Each subject was an experienced driver who used his car every day, and for the study drove from his work place to the hospital during the later afternoon. This drive took place in urban traffic and the average duration was 20.9 minutes. Blood pressure during car driving was remarkably stable, and the average systolic and diastolic pressures were similar to the mean daytime pressure. After 16 weeks of treatment with oxprenolol each patient was restudied. Blood pressure during driving had dropped from 176/107 to 160/93 mmHg, but the blood pressure response to driving and blood pressure variation during driving (expressed as the coefficient of variation) were unchanged. After treatment, the mean daytime systolic pressure was lower than the mean pressure during driving, but the relative antihypertensive effect during driving was similar to that observed in the same patients during dynamic exercise on a bicycle ergometer. No drug-induced side effects occurred and there were no apparent effects on driving ability. Chronic treatment with oxprenolol reduced blood pressure during car driving without affecting the normal blood pressure response to driving.

Millar-Craig, MW Mann, S Balasubramanian, V Cashman, P Raftery, EB *British Heart Journal* Vol. 45 No. 6, HS-033 082, June 1980, pp 643-648, Figs., Tabs., 17 Ref.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: British Medical Association, BMA House, Tavistock Square, London, England

367627

EFFECTS OF RAISING THE LEGAL DRINKING AGE IN ONTARIO

This paper reports four types of data which are relevant to the study of the effects of the increase in the drinking age. The data are from: (1) surveys of drinking and drinking problems among high school students; (2) a study of perceptions of vice-principals; (3) a trend analysis of young drinking offender charges; and (4) trend analyses of drinking-driving statistics. The results suggest a minimal effect for the changes in the legal drinking age.

Vingilis, E Smart, RG (Addiction Research Foundation, Toronto) *British Journal of Addiction* Vol. 76 No. 4, HS-033 083, Dec. 1981, pp 415-424, 3 Tabs., 24 Ref.

Acknowledgment: National Highway Traffic Safety Administration
Order From: Longman Group Limited, Journals Division, 43-45 Annandale Street, Edinburgh, Scotland

367628
EMERGENCY RESCUE

This article discusses three pieces of emergency medical equipment which are designed with consideration of the emergency medical technicians as well as the patient. The equipment described include an ambulance cot, a battery-operated suction pump with disposable collection bottles and chemical lightsticks.

National Safety News Vol. 125 No. 5, HS-033 084, May 1982, pp 38-39, 2 Phots.

Acknowledgment: National Highway Traffic Safety Administration
Order From: National Safety Council, 444 North Michigan Avenue, Chicago, Illinois, 60611

367629
FOR 1981 PRELIMINARY ACCIDENT REPORT, WORK DEATHS DECREASED

The 1981 accident death total was approximately 99,500, a five percent decrease from 1980. Motor vehicle accidents in 1981 were responsible for 51 per cent of the death total. This article gives preliminary statistical data on: Death totals; Disabling work injuries; Incidence rates; Accident costs; Fire losses; Total average employment; Off-the-job accidents; Time loss; Industrial commission records; Accident deaths. Two charts are included: Work Death Rates 1971-1981 with percentage of change (by industry groups) and The National Accident Fatality Toll 1980-1981 with percentage of change (all accidents).

Hoskin, AF *National Safety News* Vol. 125 No. 5, HS-033 086, May 1982, pp 60-61, 2 Tabs.

Acknowledgment: National Highway Traffic Safety Administration
Order From: National Safety Council, 444 North Michigan Avenue, Chicago, Illinois, 60611

367630
FRAMEWORK OF LIGHTWEIGHT MATERIALS

This article discusses the new ways in which the auto industry is using steel, aluminum, and plastic materials. Lightweight aluminum is being used for trim moldings, inner and outer hood panels, sun roof hatch frame and panel, luggage racks, and air deflectors. Steel, however, remains the material that gets the highest percentage of body and structural applications. Dual phase steel is the latest addition to the high strength steel category. Black plate steel is an extra thin low carbon sheet which competes effectively against aluminum. Metal/plastic/metal laminate sandwiches are used for their light weight, good strength and relative low cost. Possible applications include load floors, narrow body panels, and trailer sides for heavy-duty trucks. Plastic for exterior application is glass fiber reinforced thermoset polyester in SMC (sheet molding compound) form.

McCann, MK *Automotive Industries* Vol. 162 No. 5, HS-033 087, May 1982, pp 31-34, Phots.

Acknowledgment: National Highway Traffic Safety Administration
Order From: Chilton Company, Chilton Way, Radnor, Pennsylvania, 19089

367631
FUEL DELIVERY SYSTEMS. WHAT CAN GO WRONG?

A periodic inspection of the fuel system--fuel tank, delivery line, pump, filter, charcoal canister, and vapor-recovery line--can reduce the chances of fuel-delivery system malfunctions happening. But if a problem does occur, understanding how the system works and knowing how to trouble-shoot it, can help correct it quickly. This article explains how to inspect the system, how to track down problems and how to change a mechanical pump. Two illustrations are included: the complete fuel system, and the mechanical pump.

Mercaldo, S *Popular Science* Vol. 220 No. 6, HS-033 088, June 1982, pp 95-97, 2 Figs.

Acknowledgment: National Highway Traffic Safety Administration
Order From: Times Mirror Magazines, Incorporated, 380 Madison Avenue, New York, New York, 10017

367632
HOW MUCH IS TOO MUCH TRAFFIC

To answer the question which is posed as the title of this article, the author uses an analytical approach, aware that this is a very subjective matter and will require extensive pragmatic study for validation. The article relies a great deal on the ideas set forth in 1963 by Professor Colin Buchanan in his study entitled "Traffic in Town, A Study of the Long-Term Problems of Traffic in Urban Areas" (Her Majesty's Stationary Office, London, U.K.). The conclusion reached is that there are possibly three separate thresholds for local residential street traffic environmental quality. These three thresholds are graphically plotted as impact versus flow by exposure and are discussed in greater detail.

Spitz, S (Berryman and Stephenson Incorporated) *ITE Journal* Vol. 52 No. 5, HS-033 089, May 1982, pp 44-45, 1 Fig., 1 Tab., 1 Phot., 5 Ref.

Acknowledgment: National Highway Traffic Safety Administration
Order From: Institute of Transportation Engineers, 525 School Street, SW, Suite 410, Washington, D.C., 20024

367633
DO IT YOURSELF. IMPROVING OUTSIDE LIGHTING TECHNIQUES

This article explains how to install indicator lights for D.C. circuits (Entry Light Indicator), A.C. circuits (Awning Lantern Indicator) and on-off switches in recreational vehicles.

Klein, S *Trailer Life* Vol. 42 No. 6, HS-033 090, June 1982, pp 128-129, Figs., Tabs.

Acknowledgment: National Highway Traffic Safety Administration
Order From: Trailer Life Publishing Company Incorporated, 23945 Craftsman Road, Calabasas, California, 92132

367634
IN MOTORCYCLE ACCIDENTS--HELMETS ARE NOT THE WHOLE ANSWER

This article reports the results of a study undertaken by the Wisconsin Department of Transportation on the effectiveness of motorcycle helmets. The findings and data presented lead to the conclusion that helmets save lives and prevent head injuries. This conclusion, however, does not mandate reinstitution of the mandatory helmet law. Helmeted riders suffered head injuries in one out of four accidents. This indicates that an effective motorcycle safety program must concentrate on accident prevention. Such a program would involve educating and training of cyclists and other motorists as well.

Fleming, RR (Wisconsin Department of Transportation) *Traffic Safety* Vol. 82 No. 3, HS-033 091, May 1982, 6p, Tabs., Phots.

Acknowledgment: National Highway Traffic Safety Administration
Order From: National Safety Council, 444 North Michigan Avenue, Chicago, Illinois, 60611

367635
INJURY PATTERNS AND HELMET EFFECTIVENESS AMONG HOSPITALIZED MOTORCYCLISTS--SPECIAL ARTICLE

Motorcycle use in Minnesota has been increasing steadily over the past decade as have injuries and deaths resulting from motorcycle collisions. Three-hundred ninety-seven motorcycle injury cases were identified at seven Minneapolis-St. Paul area hospitals. Information on the nature and severity of injury and the circumstances surrounding the accident was obtained. Extremity injuries occurred most commonly. Head injuries were present in 40 percent of the cases. A case-control approach was used to describe the association between helmet use and head trauma.

Carr, WP (Minnesota Department of Health) Brandt, D (Unity Medical Center, Minneapolis) Swanson, K (Minnesota Department of Public Safety) *Minnesota Medicine* Vol. 64 No. 9, HS-033 092, Sept. 1981, pp 521-527, 13 Tab., 25 Ref.

Acknowledgment: National Highway Traffic Safety Administration
Order From: Minnesota State Medical Association, 101 E Fifth Street, N 900, St Paul, Minnesota, 55101

367636

RADAR CONTROL FOR AUTOMOTIVE COLLISION MITIGATION AND HEADWAY SPACING

A small solid-state radar combined with a microprocessor makes possible collision-mitigation braking and automatic headway control in cars of the future. The collision-mitigation function involves the application of antiskid brakes under conditions where, based on radar and other sensor inputs, it is certain that a severe collision will take place. The decision-making algorithm is optimized to prevent the unjustified application of the brakes from false alarms. The automatic headway-control function keeps the car at a safe distance with respect to other vehicles on the road ahead. In the absence of other cars the system operates as a conventional cruise control.

Belohoubek, EF (David Sarnoff Research Center, Princeton) *IEEE Transactions on Vehicular Technology* Vol. VT31 No. 2, HS-033 093, May 1982, pp 89-99, 16 Fig., 12 Ref.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: ESL

367637

JOINT BIOMECHANICAL RESEARCH PROJECT KOB [FORSCHUNGSVERBUND BIOMECHANIK]

Seven institutions participated in the Joint Biomechanical Research Project to study the biomechanical aspects involved in the evaluation of passenger car safety. In order to obtain an insight into the mechanisms leading to injuries in road accidents, 16 selected accidents were reconstructed under controlled conditions. The study focused on frontal and side collisions of two vehicles and car-pedestrian collisions. Car occupants were simulated by dummies and cadavers and loads and movements measured on these subjects in 133 tests. The report comprises an extensive comparison between real accidents and the experiments. The reproducibility of the test results is being checked at different laboratories. The dummies available turned out to be of limited use, at least as far as the reconstruction of side collisions and pedestrian accidents is concerned. For the protection criteria used in the car tests, modified values have been suggested in some cases. The study confirmed once more the usefulness of safety belts. A number of objectives for future research projects are outlined.

Unfall und Sicherheitsforschung Strassenverkehr No. 34, HS-033 094, 1982, 140p, Figs., Tabs., Phots., Refs.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: Federal Institute of Road Research, West Germany, Bruhlerstrasse 1, Postfach 510530, D-5000 Cologne 51, West Germany

367638

MOTORCYCLE FATALITIES IN SOUTH WEST CUMBRIA

In the area studied, fatal motorcycle accidents were more often the fault of a motorcyclist than of another road user. Pillion passengers contributed to some accidents, and the law should restrict the consumption of alcohol by pillion riders as well as by motorcycle drivers. Injury to the brain or brain stem was a major cause of death despite crash helmets. Haemorrhage might have been successfully arrested in some patients who survived to reach the hospital, though this might not have guaranteed survival. The potential reduction in mortality is discussed in relation to injury severity score. A saving in life is more likely to accure from preventive means than from improved rescue and treatment facilities.

Harrop, SN Wilson, RY (North Lonsdale Hospital, Cumbria) *Injury* Vol. 13 No. 5, HS-033 095, Mar. 1982, pp 382-387, 2 Fig., 4 Tab., Refs.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: Harrop (SN), 9 Parrfield Road, Roe Green, Worsley, Manchester M28 4RR, England

367639

1981 MOTOR VEHICLE DEATHS ON A DOWNGRADE

This article reports the National Safety Council motor vehicle statistics for 1981. The statistics cover these areas: travel; number of vehicles; number of drivers; death rate; turnipke experience; injuries; factors affecting motor-vehicle deaths in 1981; regional changes; urban-rural fatality experience; deaths by type of accident; deaths by age of victim; state and city experience.

Carraro, B *Traffic Safety* Vol. 82 No. 3, HS-033 096, May 1982, 4p, Tabs.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: National Safety Council, 444 North Michigan Avenue, Chicago, Illinois, 60611

367640

ONSET OF PEAK IMPAIRMENT AFTER DIAZEPAM AND AFTER ALCOHOL

Single doses of diazepam induced peak impairment of performance on cognitive and psychomotor tasks early (20 min after ingestion), when blood levels had reached less than two thirds of their eventual plateau. Alcohol did not have this effect. Early peak impairment and the acute tolerance that follows it contribute greatly to the lack of correlation between diazepam plasma level and performance impairment.

Ellinwood, EH Linnoila, M Easler, ME Molter, DW *Clinical Pharmacology and Therapeutics* Vol. 30 No. 4, HS-033 097, Oct. 1981, pp 534-538, 1 Fig., 23 Ref.

Direct requests for reprints to Everett H Ellinwood at the Duke University Medical Center.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: Duke University Medical Center, P.O. Box 3870, Department of Psychiatry, Durham, North Carolina, 27710

367641

THE ROLE OF HELMETS IN REDUCING HEAD INJURIES FROM MOTORCYCLE ACCIDENTS: A POLITICAL OR MEDICAL ISSUE?

The cases of 311 motorcycle accident victims who were seen at a major trauma center over 17 months were reviewed. The types and severity of injuries were standardized according to the Injury Severity Score (ISS) for motor vehicle accidents. Victims were categorized into groups: helmet or no helmet and major, minor or no head injury. Major injury was defined as a 3 on the Abbreviated Injury Scale for "head" (loss of consciousness for at least 15 minutes with or without skull fracture and with or without neurological deficit). The following conclusions are drawn: (1) The death rate for those with and without helmets was not significantly different, (2) the victims of fatal accidents had identical total ISS scores regardless of the presence of helmets, (3) the chance of sustaining a severe head injury was significantly higher in the no helmet group and (4) the incidence of long-term neurological defect was three times greater in the no helmet group.

Luna, GK Copass, MK Oreskovich, MR Carrico, CJ (Washington University School of Medicine) *Western Journal of Medicine* Vol. 135 No. 2, HS-033 098, July 1981, pp 89-92, 5 Tab., 6 Ref.

Direct requests for reprints to Michael R Oreskovich at Harborview Medical Center.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: Harborview Medical Center, Department of Surgery, 325 Ninth Avenue, Seattle, Washington, 98104

367642

SAFETY AND THE BERMUDA TRICYCLE

Three-wheel all-terrain vehicles are very popular, but because they handle in an unusual way they are also one of the newest tickets to becoming a sports and recreational accident statistic. This very well illustrated article provides safe riding tips.

Driver Vol. 15 No. 11, HS-033 099, Apr. 1982, pp 8-13, Phots.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: US Air Force Inspection and Safety Center, Norton AFB, California, 92409

367643

THE SHAPE OF CARS TO COME

Now that GM, Ford and Chrysler have pretty well caught up with the rest of the auto world in such matters as down-sizing, weight-shaving, front-wheel drive and assembly by robots, the emerging competition is in what used to be called styling, and is now called design and the source of this design renewal is America. This article reviews the evolution of the automobile industry, both domestic and foreign and gives an idea of what the car of tomorrow will look like.

McQuade, W *Fortune* Vol. 105 No. 11, HS-033 100, May 1982, pp 68-77, Phots.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: Time Incorporated, 541 North Fairbanks Court, Chicago, Illinois, 60611

367644

TEST METHODOLOGY FOR EVALUATION OF FIREWORTHY AIRCRAFT SEAT CUSHIONS

Aircraft seat materials were evaluated in terms of their thermal performance. The materials were evaluated using (a) themogravimetric analysis, (b) differential scanning calorimetry, (c) a modified NBS smoke chamber to determine the rate of mass loss and (d) the NASA T-3 apparatus to determine the thermal efficiency. In this paper, the modified NBS smoke chamber will be described in detail since it provided the most conclusive results. The NBS smoke chamber was modified to measure the weight loss of materials when exposed to a radiant heat source over the range of 2.5 to 7.5 W/sq cm. This chamber has been utilized to evaluate the thermal performance of various heat blocking layers utilized to protect the polyurethane cushioning foam used in aircraft seats. Various kinds of heat blocking layers were evaluated by monitoring the weight loss of miniature seat cushions when exposed to the radiant heat. The effectiveness of aluminized heat blocking systems was demonstrated when compared to conventional heat blocking layers such as neoprene. All heat blocking systems showed good fire protection capabilities when compared to the state-of-the-art i.e., wool-nylon over polyurethane foam.

Kourtides, DA Parker, JA (Ames Research Center) *Journal of Fire & Flammability* Vol. 15 HS-033 101, Jan. 1982, pp 56-76, 12 Fig., 9 Tab., 8 Ref.

Based on a paper presented at the Seventh International Conference on Fire Safety, Menlo Park, California January 11-15 1982.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: Technomic Publishing Company, Incorporated, 265 Post Road West, Westport, Connecticut, 08660

367645

A REVIEW OF RURAL SPEED LIMITS IN AUSTRALIA

The National Road Traffic Code is being reviewed by the Advisory Committee on Road User Performance and Traffic Codes (ACRUPTC), and during 1978/79 an assessment of speed limit provisions in the Code was undertaken. The present study was originally performed to contribute to the ACRUPTC review, but it has been subsequently updated to include the changes which were made in late 1979 to the Code provisions and to State and Territory practice. The study has concentrated upon rural speed limits, as the main differences between Code provisions and Australian practice are in this area. The study therefore examines local and overseas information on rural free speeds and speed limits in relation to road-traffic safety; this includes recent Australian speed data obtained from the national survey carried out in 1978/79 under the co-ordination of ACRUPTC. The report recommends options for absolute and differential speed limits for Australian rural roads.

Cowley, JE
Cowley (JE) and Associates CR 20, HS-033 110, Jan. 1980, 88p, Figs., Tabs., Refs.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: Department of Transport, Australia, Office of Road Safety, GPO Box 1839Q, Melbourne, Victoria 3001, Australia

367646

EJECTION AND THE EFFECT OF AUSTRALIAN DESIGN RULE 2 FOR DOOR LATCHES AND HINGES

Australian Design Rule No. 2 (ADR 2) specifies requirements for side door latches and hinges, with the intention of minimising the likelihood of occupant ejection in crashes. It came into effect for new passenger cars and derivatives on 1 January 1971 and for other types of Vehicles at later dates. Australian manufacturers began fitting so-called "anti-burst" door latches to some cars in the early 1960's. Information from the Royal Australasian College of Surgeons Pattern of Injury Survey of crashes and injuries in Victoria was analysed to measure the effect of the anti-burst door latches and ADR 2. Initially it was established that ejection doubles the risk of severe-to-fatal injury compared with being contained in the car in the same crash circumstances. Ejection, door opening, and the proportion of ejectees who were ejected from vehicles with closed doors were then used as criteria for the effect of ADR 2. The study concluded that ADR 2 (and the anti-burst door latches fitted prior to formal requirements) is effective in reducing the risk of ejection, via a reduction in the probability of door opening, for the occupants of cars and car derivatives involved in non-rollover crashes. ADR 2 transfers the route of ejection of the remaining ejectees away from the door opening and towards non-door portals. Regarding the effectiveness of ADR 2 in rollover crashes, the study was inconclusive due to the relatively small number of occupant casualties involved in crashes of this type and also due to the possibility that the later model cars may have been involved in more severe rollover crashes than the older cars. Anti-burst door latches may be in need of improved design to take account of whatever mechanism opens doors in rollovers. ADR 2 still has a meaningful role in modern vehicles with high rates of seat belt use. The Design Rule is effective, at least in non-rollover crashes, in reducing the risk of ejection of seat belt wearers as well as non-wearers.

Cameron, MH
Cameron (MH) and Associates CR 15, HS-033 111, Sept. 1980, 71p, Tabs., Refs., Apps.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: Department of Transport, Australia, Office of Road Safety, GPO Box 1839Q, Melbourne, Victoria 3001, Australia

367647

THE ECONOMIC AND SOCIAL COSTS OF ROAD ACCIDENTS IN AUSTRALIA: WITH PRELIMINARY COST ESTIMATES FOR AUSTRALIA IN 1978

This report contains a review of recent accident cost estimation studies and proposes a unit cost framework which is considered appropriate from both conceptual and empirical view points for the estimation of the social costs of road accidents in Australia. A detailed set of unit and total cost estimates for Australia in 1978 is presented, based mainly on existing data sources, supplemented by accident claims data from a sample of insurance companies and the Motor Accidents Board of Victoria. These preliminary cost estimates are also classified according to injury severity. Problems associated with accident statistics and data sources are discussed together with the estimation procedures. The report concludes that social costs provide only minimum estimates of the benefits gained from accident reduction, and also that the use of average cost levels is constrained by the skewed distribution of most accident cost characteristics. Further research directed towards refinement of the conceptual and empirical bases of these estimates is recommended.

Atkins, AS
Melbourne University, Australia CR 21, HS-033 112, June 1981, 128p, Figs., 65 Tab., Refs., Apps.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: Department of Transport, Australia, Office of Road Safety, GPO Box 1839Q, Melbourne, Victoria 3001, Australia

367648

DRINK-DRIVING COUNTERMEASURES, A STUDY OF THE VICTORIAN SYSTEM

In this study, a system analysis approach was used to describe and quantify the Drink-Driving Countermeasure System in Victoria, as it was in 1977. This approach involved a comprehensive description of the work carried out in the education-publicity, legislative, enforcement, judicial and medical rehabilitation areas and of the interaction of the components of the system and the environmental constraints under which it functions. The study included a field survey which was conducted to identify the various activities within the system. In addition, data were collected for various samples of drivers in order to achieve an understanding of their characteristics and progress through the system. This report contains information on how drivers entered the enforcement subsystem, their personal characteristics, blood alcohol concentration, prior conviction history, whether or not they were prosecuted and results of court hearings. The results of this study have led to recommendations for improvements to the system and additional research.

Hendtlass, J Bock, IM Ryan, MP
Victoria Road Safety & Traffic Authority,Australia CR 23, HS-033 113, Oct. 1981, 158p, Figs., Tabs., Refs., Apps.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: Department of Transport, Australia, Office of Road Safety, GPO Box 1839Q, Melbourne, Victoria 3001, Australia

367649

PASSENGER CAR OCCUPANT EJECTION

This is the final report for Project Number 1153 entitled "Occupant Ejection/Accident Data Analysis," sponsored by the Motor Vehicle

Manufacturers Association. The project aimed to determine the influence of various vehicle systems in preventing (or not preventing) occupant ejection from passenger cars. Accident data from the National Highway Traffic Safety Administration's Fatal Accident Reporting System and from the National Crash Severity Study (NCSS) were examined. In addition, a special analysis was completed for a subset of the NCSS data in which only one of two front-seat occupants was ejected. The reduction in ejection rate associated with the advent of improved door latches and glazing components appears to have levelled off. In the mix of cars of varied size, there are complex interactions of factors associated with ejection. While smaller cars generally have higher ejection rates, these are largely explained by a higher propensity to rollover and by the predominance of young drivers in these cars.

Bertram, B O'Day, J
Highway Safety Research Institute, Motor Vehicle Manufacturers Assn of the U.S., Inc Final Rpt. UM-HSRI-81-42, HS-033 114, July 1981, 50p, 7 Fig., 10 Tab., 17 Ref., Apps.

Acknowledgment: National Highway Traffic Safety Administration
Order From: Highway Safety Research Institute, Huron Parkway and Baxter Road, Ann Arbor, Michigan, 48109

367650

OCCUPANT SURVIVABILITY IN HEAVY-TRUCK CRASHES

Rollover and ejection are associated with heavy-truck occupant fatalities about twice as frequently as for passenger-car occupant fatalities. A panel reviewed 41 in-depth cases to assess the possbile effectiveness of restraint use and the contribution of rollover and ejection to the fatal injuries. The panel's responses indicated that belt use was expected to be particularly effective in preventing fatalities resulting from occupant ejection. The effectiveness of FMVSS 206, which required stronger door latches, seems to be reflected in lower ejection rates for 1972 and newer model year heavy trucks.

Wolf, B Campbell, KL O'Day, J
Highway Safety Research Institute, Motor Vehicle Manufacturers Assn of the U.S., Inc Spec Rpt. UM-HSRI-81-55, HS-033 115, Nov. 1981, 34p, 6 Fig., 12 Tab.

Acknowledgment: National Highway Traffic Safety Administration
Order From: Highway Safety Research Institute, Huron Parkway and Baxter Road, Ann Arbor, Michigan, 48109

367651

LIGHTING EQUIPMENT AND PHOTOMETRIC TESTS

Advisory standards and recommended practices for motor vehicle lighting, including motorcycles, agricultural machinery, construction and industrial machinery, snowmobiles, seven conductor electrical connector for truck trailer jumper cable, seven conductor jacketed cable for truck trailer connections and low tension primary cable.

Society of Automotive Engineers, Incorporated HS 34, HS-033 116, 1982, v.p., Figs., Tabs.

Acknowledgment: National Highway Traffic Safety Administration
Order From: SAE

367652

FLUID CONDUCTORS AND CONNECTORS

Advisory standards and recommended practices for automotive tubings and fittings.

Society of Automotive Engineers, Incorporated HS 150, HS-033 117, 1982, v.p., Figs., Tabs.

Acknowledgment: National Highway Traffic Safety Administration
Order From: SAE

367653

IRON AND STEEL

Advisory standards and recommended practices for ferrous metals. Contents: Numbering system, chemical compositions, general data on steel, methods of testing steel, steel fasteners, spring wire and springs, ferrous castings, tool and die steels, ferrous materials, and ferrous and nonferrous--general.

Society of Automotive Engineers, Incorporated HS-30, HS-033 118, 1982, v.p., Figs., Tabs.

Acknowledgment: National Highway Traffic Safety Administration
Order From: SAE

367654

LICENSE REVOCATION AND ALCOHOLISM TREATMENT PROGRAMS FOR HABITUAL TRAFFIC OFFENDERS

The Washington Habitual Traffic Offender Act was evaluated to determine its effectiveness in reducing traffic violations and collisions. The law requires a five-year license revocation for drivers who have accumulated three or more major traffic convictions or 20 or more total convictions. The law also permits a stay of the revocation for alcoholic drivers who have undertaken an approved alcoholism treatment program. The study was designed to assess the subsequent driving performance for revoked drivers and stayed drivers as compared to control groups of drivers who were eligible for but did not receive these sanctions. It was found that license revocation was associated with significant reductions in moving violation convictions and collisions as compared to control group drivers. Stay of revocation, however, had no impact on subsequent driving performance. The data were consistent with the possibility that revoked drivers continue to drive during the license denial period but may drive more cautiously in an attempt to avoid detection. The stayed drivers, in contrast, apparently did not modify their driving behavior as compared to drivers who avoided habitual offender sanctions.

Salzberg, PM Hauser, R Klingberg, CL *American Assoc for Auto Med. Quarterly/Journal* Vol. 4 No. 2, HS-033 119, Apr. 1982, pp 30-37, 2 Tab., 8 Ref., Apps.

Acknowledgment: National Highway Traffic Safety Administration
Order From: American Association for Automotive Medicine, P.O. Box 222, Morton Grove, Illinois, 60053

367655

EACH WHEEL PLAYS PART IN HANDLING: HERE IS HOW TO HELP AFT SET DO ITS PART

This article is a detailed discussion of vehicle handling with emphasis on the role that rear suspension plays in it. It reviews slip angle, common types of rear axles, rear wheel alignment factors and nose angle adjustment. A chart "Universal joint angle specifications with full gas tank" is included.

Carrier, H, Editor *Brake and Front End* Vol. 52 No. 4, HS-033 120, Apr. 1982, pp 48-52, 7 Fig.

Acknowledgment: National Highway Traffic Safety Administration
Order From: Babcox Publications, Incorporated, 11 South Forge Street, Akron, Ohio, 44304

367656

TRANSPORTATION FOR THE HANDICAPPED: THE POLITICS OF FULL ACCESSIBILITY

This article discusses the role of political influence on the character of American transportation. Taking as an example the politics of full accessibility in the provision of transportation for the handicapped, this article traces the political history of this issue from the initial development of the concept of mainstreaming (equal access rather than equal mobility) through the effective lobbying in the early 1970's which resulted in the Federal regulations published by the Department of Transportation on May 31, 1979, to the U.S. Appeals Court ruling on May 26, 1981 that Section 504 of the 1973 Rehabilitation Act "does not give federal agencies the power to impose such onerous affirmative burdens on local programs."

Fielding, GJ (California University, Irvine) *Transportation Quarterly* Vol. 36 No. 2, HS-033 121, Apr. 1982, pp 269-282

Acknowledgment: National Highway Traffic Safety Administration
Order From: Eno Foundation for Transportation, Incorporated, P.O. Box 55, Saugatuck Station, Westport, Connecticut, 06880

367657

PASSIVE RESTRAINTS: A REGULATOR'S VIEW

This article begins with a review of the legal and scientific basis for the National Highway Traffic Safety Administration (NHTSA) automatic occupant crash protection standard. This standard, Federal Motor Vehicle Safety Standard 208, was promulgated under the National Traffic and Motor Vehicle Safety Act of 1966, which was amended in 1974 to give Congress an opportunity to review the promulgation of standards for occupant restraints other than safety belts. The review is followed by an evaluation of automatic crash protection and a listing of the factors which dominate the economics of automatic crash protection. In conclusion it is stated that the NHTSA believes field tests of automatic restraint systems adequately justify widespread commercialization, and the NHTSA does not believe public policy should become a slave to cost benefit considerations.

Nash, CE
Brookings Institution HS-033 122, 1981, pp 53-67

Extracted from The Scientific Basis of Health and Safety Regulation, prepared by the Brookings Institution.

Acknowledgment: National Highway Traffic Safety Administration
Order From: Brookings Institution, 1775 Massachusetts Avenue, NW, Washington, D.C., 20036

367658

CITIZEN PARTICIPATION IN TRAFFIC SAFETY

In 1975 the City Council in Troy, Michigan established a Citizen Traffic Committee to provide local officials with an opportunity to review factual situations, engineering recommendations, public safety recommendations, and citizen input before having to take a position on a particular recommendation. The Committee keeps elected officials from having to make a decision based solely on emotional considerations and allows time for engineering recommendations to be considered as well. Assuming that a similar committee can provide the same kind of benefits to other communities, this article presents a discussion on the organization of such a committee and how it operates (including a typical agenda), followed by a summation of the specific contributions to traffic safety that the Citizen Traffic Committee has made in the City of Troy.

Beaubien, RF *ITE Journal* Vol. 52 No. 3, HS-033 123, May 1982, pp 29-31, 1 Phot., 7 Ref.

Acknowledgment: National Highway Traffic Safety Administration
Order From: Institute of Transportation Engineers, 525 School Street, SW, Suite 410, Washington, D.C., 20024

367659

AUTO THEFT IN MASSACHUSETTS--AN EXECUTIVE RESPONSE

In an effort to reduce Massachusetts' dubious distinction of being number one in the nation in the motor vehicle theft rate, Governor Edward J. King signed an Executive Order on December 4, 1979 establishing a Task Force on Automobile Theft. The Task Force's mandate was to bring together, for the first time on a state level, the principal parties concerned with the auto theft problem. It was to conduct an intensive, immediate study of the problem, and submit its specific findings and recommendations to the Governor by February 29, 1980. The membership of the Task Force included federal officials, insurance experts, the judiciary, prosecutors, registry officials, state and local police and automobile trade association representatives. Additionally, for the first time ever in a state criminal justice planning unit, victims of this crime were formally represented on this panel. The Task Force conducted public hearings on January 16, 17, and 18, 1980. Its review was comprehensive-examining present investigative and enforcement resources, the prosecution and judicial response, the disposition of offenders, and finally, crime prevention and public education techniques. This Report provides a summary of the Task Force's findings and recommendations, together with the specific legislative and executive reform proposals to carry those recommendations into effect.

Governor's Task Force on Automobile Theft HS-033 124, Mar. 1980, 124p, 15 Fig., Tabs., Apps.

Acknowledgment: National Highway Traffic Safety Administration
Order From: Office of the Governor, State House, Room 271, Boston, Massachusetts, 02133

367660

MOTOR GASOLINES, SUMMER 1981

The samples were collected from service stations throughout the country and were analyzed in the laboratories of various refiners, motor manufacturers, and chemical companies. The analytical data for 715 samples of motor gasoline, were submitted to the Bartlesville Energy Technology Center for study, necessary calculations, and compilation under a cooperative agreement between the Bartlesville Energy Technology Center (BETC) and the American Petroleum Institute (API). They represent the products of 33 companies, large and small, which manufacture and supply gasoline. These data are tabulated by groups according to brands (unlabeled) and grades for 17 marketing districts into which the country is divided. A map included in this report, shows marketing areas, districts and sampling locations. The report also includes charts indicating the trends of selected properties of motor fuels since 1959. Sixteen octane distribution percent charts for areas 1, 2, 3, and 4 for unleaded antiknock index (R plus M)/2 below 90.0, unleaded antiknock index (R plus M)/2 90.0 and above leaded antiknock index (R plus M)/2 below 93.0, and leaded antiknock index (R plus M)/2 93.0 and above grades of gasoline are presented in this report. The antiknock (octane) index (R plus M)/2 averages of gasoline sold in this country were 87.4 for unleaded below 90.0, 91.3 for unleaded 90.0 and above, 89.0 for leaded below 93.0, and no data in this report for 93.0 and above grades of leaded gasoline.

Shelton, EM
Department of Energy DOE/BETC/PPS-82/1, HS-033 125, Apr. 1982, 64p, 21 Fig., Tabs.

Acknowledgment: National Highway Traffic Safety Administration
Order From: NTIS

367661

BASIC DATA ON ANTHROPOMETRIC MEASUREMENTS AND ANGULAL MEASUREMENTS OF THE HIP AND KNEE JOINTS FOR SELECTED AGE GROUPS 1-74 YEARS OF AGE UNITED STATES, 1971-1975

This report presents findings on anthropometric and goniometric measurements from the first National Health and Nutrition Examination Survey, 1971-75. The survey, conducted by the Division of Health Examination Statistics of the National Center for Health Statistics, was designed to collect data by direct examination of probability samples of the U.S. civilian noninstitutionalized population 1-74 years. Data included measures of nutritional status as well as an assessment of health and medical care needs.

Public Health Service, (DHHS PHS 81-1669) Series 11, N219, HS-033 126, Apr. 1981, 68p, Figs., Tabs., Apps.

Acknowledgment: National Highway Traffic Safety Administration
Order From: Public Health Service, National Center for Health Statistics, Hyattsville, Maryland

367662

THE TRUTH ABOUT TRUCK SAFETY

The purpose of this brochure is to provide facts about truck safety to the public and to refute erroneous allegations by anti-truck groups which attempt to generate fear and misunderstanding among highway users. The data are from the U.S. Department of Transportation and the National Safety Council. Except where otherwise stated, data relating to small personal-use pickup trucks and vans are not included. In all cases, information is the most recent available.

American Trucking Associations HS-033 127, Mar. 1982, 12p

Acknowledgment: National Highway Traffic Safety Administration
Order From: American Trucking Associations, Public Relations Department, 1616 P Street, NW, Washington, D.C., 20036

367663

YOUNG DRIVER ACCIDENTS: MAGNITUDE AND CHARACTERISTICS OF THE PROBLEM

Injuries and deaths resulting from the disproportionate collision involvement of young drivers have long been recognized as a major health and safety problem in Canada. An effective response to the problem has, however, been absent. In part, this is attributable to the absence of an empirically based understanding of the magnitude of the problem, its major characteristics, its causes and its correlates. Indeed, in Canada, even the magnitude of the problem has not been well-defined. The present report attempts to reduce the knowledge-gap by documenting the magnitude of the problem of young driver accidents in Canada, and evaluating several of the factors that contribute to the overrepresentation of young drivers in serious collisions.

Mayhew, DR Warren, RA Simpson, HM Haas, GC
Traffic Injury Research Foundation of Canada HS-033 128, Nov. 1981, 158p, Figs., Tabs., 47 Ref., Apps.

Acknowledgment: National Highway Traffic Safety Administration
Order From: Traffic Injury Research Foundation of Canada, 171 Nepean Street, 6th Floor, Ottawa, Ontario K2P 0B4, Canada

367664

WYOMING'S FATAL ACCIDENT FACTS 1981

During 1981, fatal traffic accidents totaled 232 resulting in 264 deaths and 224 injuries. 1981 surpassed 1976 as the worst year when 260 persons died in 225 fatal accidents. One possible reason for the increases in 1976 and 1981 is higher traffic volumes for these years. 1976 was the end of an oil embargo and recessionary period so the public returned to the roads. 1981 enjoyed a nationwide oil glut and gasoline price stabilization which provided more incentive for driving. Traffic volumes increased on Wyoming roads and so did fatal accidents for these years. The primary purpose of this document is not to make conclusions, but to provide information to groups, agencies, and individuals interested in reducing the number of traffic deaths. The facts here are presented in the form of tables and summaries, with some narrative. It is our intent that this data be used for statistical and analytical purposes by those promoting highway safety. Sources for the data contained in this report include accident reports submitted by individuals and investigating officers, as well as miscellaneous reports from State's motor vehicle or licensing divisions, and newspaper articles. "Wyoming's Fatal Accident Facts" excludes fatal accidents that occurred within Yellowstone National Park Boundaries and those occurring on Indian Reservations, because these jurisdictions maintain their own separate accident statistics. Also excluded are fatal accidents ocurring on private property or those caused by legal intervention or unlawful intent.

Wyoming State Highway Department HS-033 129, Apr. 1981, 57p, Tabs., Phots.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: Wyoming State Highway Department, P.O. Box 1708, Cheyenne, Wyoming, 82001

367665

MOTOR CARRIER ACCIDENT INVESTIGATION. GROVER TRUCKING COMPANY, IDAHO FALLS, IDAHO. RUNAWAY TRUCK ACCIDENT

This is the investigative report of a runaway truck accident which occurred on July 15, 1981 on U.S. 95 in White Bird, Idaho. A southbound truck-tractor flatbed semitrailer, operated by the Grover Trucking Company, ran out of control on a steep downgrade and overturned. The units separated with the trailer rolling down the canyon and the tractor continuing ahead, striking a concrete bridge abutment and ejecting the truck driver. The truck driver was killed and $50,000 property damage was incurred. The probable cause of this accident was determined to be excessive speed and the over application of brakes resulting in brake fade and loss of control. It was also found that the truck driver was inexperienced in the operation of tractor trailers.

Federal Highway Administration Report N 81-1, HS-033 130, Feb. 1982, 4p, Phots.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: Federal Highway Administration, 400 7th Street, SW, Washington, D.C., 20590

367666

SEATBELT WEARING AND ADJUSTMENT TRENDS 1974-1979

Seatbelt Surveys from 1974 to 1979 are examined for trends in wearing and adjustment rates. Analysis in respect of wearing rates is undertaken separately for adults (those 15 years and over) who have been required to wear belts over the period and children who were not required to wear belts until 1978. It seems that to maintain public awareness publicity and/or enforcement campaigns may be required, at least every twelve months. It is concluded that adult wearing rates have remained in excess of 78% whilst rates for children are substantially lower. The inference is that publicity concerning wearing of belts by children has, to date, not been sufficiently effective. In view of high compliance with seatbelt fitting requirements it is suggested that regulations might be amended to require proper adjustment, and that the age for compulsory wearing be reduced still further. Several of the recommendations of this paper in this respect are currently under investigation.

Torrington, K Hull, M
Ministry of Transport, New Zealand TRR No. 26, HS-033 131, Oct. 1981, 41p, 8 Fig., 9 Tab., 4 Ref., 8 App.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: Ministry of Transport, New Zealand, Road Transport Division, Private Bag, Wellington, New Zealand

367667

THE HISTORY OF 4WD. FROM GETTING STUCK TO GETTNG STICK

The history of four-wheel-drive, from 1902, when the first 4wd vehicle appeared in the form of a truck with an electric motor at each wheel, through World War I and World War II with the Jeeps, then the building of the civilian versions, the racing car versions, to present times and the Audi Quattro, is related. In many ways, some of the questions posed by 4wd have yet to be answered, but reviewing its history shows that the all-important shift in attitudes has already taken place. The issue is no longer "Why 4wd?" but "Why not?"

Jordan, M *Car and Driver* Vol. 27 No. 12, HS-033 133, June 1982, pp 49-53, Phots.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: Ziff-Davis Publishing Company, 1 Park Avenue, New York, New York, 10016

367668

PASSENGER CARS 1982 EDITION. VEHICLE INSPECTION HANDBOOK

This revision is an effort of the Vehicle Inspection Committee of the Motor Vehicle Manufacturers Association of the U.S., in cooperation with the Committee on Engineering and Vehicle Inspection of the American Association of Motor Vehicle Administrators. It continues to provide succinct descriptions of inspection procedures and objective statements of the grounds for rejecting passenger cars and station wagons. It is responsive to motor vehicle inspection requirements and to changes in vehicle design significant to motor vehicle inspection programs. This edition interprets the American National Standards Institute's "American National Standard Inspection Procedures for Motor Vehicles, Trailers, and Semitrailers Operated on Public Highways"-ANSI Standard D7.1. Also reflected are the National Highway Traffic Safety Administration's "Vehicle In Use Inspection Standards" (Title 49 CFR Part 570), and its amendments enacted, through those of Docket No. 73-9. This Handbook is not intended as a set of hard and fast rules, but as a guide for both the individual inspector and for the person responsible for planning and implementing a meaningful inspection program based on sound engineering principles. All or any part of the book may be used, or various parts may be absorbed into a program in stages.

Motor Vehicle Manufacturers Assn of the U.S., Inc HS-033 134, Apr. 1982, 40p, Figs., Tabs., Phots.

The MVMA Vehicle Inspection Subcommittee will respond to requests from inspection officials for clarification of provisions of the Handbook for application to specific vehicles.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: Motor Vehicle Manufacturers Assn of the U.S., Inc, Technical Affairs Division, 300 New Center Building, Detroit, Michigan, 48202

367669

TRUCK/BUS/SCHOOLBUS 1982 EDITION. VEHICLE INSPECTION HANDBOOK

This revision is an effort of the Vehicle Inspection Committee of the Motor Vehicle Manufacturers Association of the U.S., in cooperation with the Committee on Engineering and Vehicle Inspection of the American Association of Motor Vehicle Administrators. It continues to provide concise descriptions of inspection procedures and objective statements of the grounds for rejecting trucks, buses, and school buses. It is responsive to motor vehicle inspection requirements and to changes in vehicle design significant to motor vehicle inspection programs. This edition interprets the American National Standards Institute's "American National Standard Inspection Procedures for Motor Vehicles, Trailers, and Semitrailers Operated on Public Highways"-ANSI Standard D7.1. Also reflected are the National Highway Traffic Safety Administration's "Vehicle In Use Inspection Standards" (Title 49 CFR Part 570), and its amendments enacted, through those of Docket No. 73-9. This Handbook is not intended as a set of hard and fast rules, but as a guide for both the individual inspector and for the person responsible for planning and implementing a meaningful inspection program based on sound engineering principles. All or any part of the book may be used, or various parts may be absorbed into a program in stages.

Motor Vehicle Manufacturers Assn of the U.S., Inc HS-033 135, Apr. 1982, 40p, Figs., Tabs., Phots.

The MVMA Vehicle Inspection Committee will respond to requests from inspection officials for clarification of provisions of the Handbook for application to specific vehicles.

Acknowledgment: National Highway Traffic Safety Administration
Order From: Motor Vehicle Manufacturers Assn of the U.S., Inc. Technical Affairs Division, 300 New Center Building, Detroit, Michigan, 48202

367670
RADIAL VS. BIAS: NO CONTEST?

As the cost of trucking continues to rise, the question of the superiority of radial tires to bias ply tires becomes crucial. This article reviews the differences between the two kinds of tires and the performance of radial tires: retreading capability, traction, noise, wear on rough roads, radials and light loads, rolling resistance, puncture resistance, and high speed durability. Tips on vehicle handling and how to maximize savings by paying attention to tire selection, inflation, vehicle alignment, tire mating, mixing, rotation and retreading are included. Tips from Goodyear on these points are listed in a box.

Witconis, L *Owner Operator* Vol. 12 No. 3, HS-033 136, May 1982, pp 52-57, Figs., Phots.

Acknowledgment: National Highway Traffic Safety Administration
Order From: Chilton Company, Chilton Way, Radner, Pennsylvannia, 19089

367671
ACCURACY OF VIRGINIA ACCIDENT DATA

The sources, magnitude, and characteristics of the inaccuracies in Virginia's police-reported accident data were examined. Five techniques were used to (1) determine how accident data are documented, (2) examine the contents of the accident report used to collect the data, and (3) document problems relating to the accuracy of the data. Recommendations were designed to enhance the overall quality of the data by (1) revising the current accident report and accompanying instruction manual, (2) modifying police training procedures, (3) upgrading the field reviews and editing procedures for the accident reports, and (4) establishing a process to continually monitor and update the police accident report.

Hargroves, BT Hargroves, JM
Virginia Highway & Transportation Research Council VHTRC 82-R13, HS-033 137, Sept. 1981, v.p., Figs., Tabs., Apps.

Acknowledgment: National Highway Traffic Safety Administration
Order From: Virginia Highway & Transportation Research Council, P.O. Box 3817, University Station, Charlottesville, Virginia, 22903

367672
EPIDEMIOLOGY OF ACCIDENTS

This third part of an article on the epidemiology of accidents is devoted to a discussion of accidents in rural areas. Statistics on the various types of accidents in rural areas in Mexico are presented. An appendix is included which lists factors, in the Mexican Republic, that increase the incidence of accidents.

Huttich, RC *Journal of Traffic Medicine* Vol. 10 No. 1, HS-033 138, Mar. 1982, pp 11-13, Apps.

See also HS-032 734 and HS-032 870, Part 1: V9 N3, TRIS 362003 and Part 2: V9 N4, TRIS 366517 respectively.

Acknowledgment: National Highway Traffic Safety Administration
Order From: International Assn of Accident & Traffic Medicine, P.O. Box 10043, S-10055 Stockholm 10, Sweden

367673
CYCLING ACCIDENTS IN THE UNITED STATES

This article points out the tremendous increase in the number of bicycles--from 42.3 million in 1968 to an estimated 62-65 million in 1981. It points out the advantages of this form of transportation, including health and recreational benefits, mobility comparable to motor travel within urban areas, low cost, quiet travel and no pollution; and also its problems and disadvantages, such as a lack of adequate facilities (bikeways, parking, etc.), inconvenience during bad weather, and an increase in the number of accidents. The remainder of this article discusses the increase in bicycle accidents. The following two sets of data are presented: Deaths among riders of pedal cycles by type of accident in the United States, 1960-1978 and Deaths among riders of pedal cycles by age in the United States, 1968 and 1978.

Metropolitan Life Insurance Statistical Bulletin Vol. 62 No. 4, HS-033 139, Oct. 1982, pp 4-6, 2 Tab.

Acknowledgment: National Highway Traffic Safety Administration
Order From: Metropolitan Life Insurance Company, 1 Madison Avenue, New York, New York, 10010

367674
PUTTING IN THE FIX. HOW TO STACK THE ODDS IN YOUR FAVOR IN THE AUTO REPAIR GAME

The profound changes in the auto industry during the past decade have had a major impact on the service end of the business. The demands of emission control, safety, and fuel economy have radically altered automotive technology. Consequently, picking a mechanic or a repair shop has become even more difficult for the motorist. This article offers suggestions on shopping for a dealer who offers good service when buying a new car, and things to look for in selecting an independent mechanic or repair shop.

Gregory, FMH *Motor Trend* Vol. 34 No. 6, HS-033 140, June 1982, 2p

Acknowledgment: National Highway Traffic Safety Administration
Order From: Petersen Publishing Company, 8490 Sunset Boulevard, Los Angeles, California, 90069

367675
AGES OF CAR DRIVERS INVOLVED IN ACCIDENTS, WITH SPECIAL REFERENCE TO JUNCTIONS

Concern about the problems facing elderly drivers in certain kinds of accident situation at junctions has prompted an investigation into ages of drivers involved in accidents with special reference to junctions. To put the problem in perspective a general analysis relating age and accident rate, based on the National Accident Statistics and the latest National Travel Surveys, has been carried out. This was followed by more detailed analysis of particular situations: urban and rural roads at and away from junctions, different kinds of manoeuvre at junctions, disobeying junction control, and others. Overall, the accident rate per km driven for elderly drivers (65 years) is just below average, while the peak rate (for the 17-19 year age group) is more than three times average. It is confirmed that elderly drivers have a higher than average risk of accident involvement for right turning movements at junctions, and at rural junctions generally. For some other kinds of accident, such as certain types of single-vehicle accident, elderly drivers have a lower than average risk of involvement. The youngest drivers have a higher than average risk of involvement in all kinds of accidents studied.

Moore, RL Sedgley, IP (University College, London) Sabey, BE
Transport and Road Research Laboratory TRRL SR 718, HS-033 142, 1982, 30p, 6 Fig., 14 Tab., Apps.

Acknowledgment: National Highway Traffic Safety Administration
Order From: TRRL

367676
SMALL CAR SAFETY: AN ISSUE THAT NEEDS FURTHER EVALUATION

The rising number of smaller cars and their ability to adequately protect their occupants are continuing concerns of vehicle and highway safety experts. The physics of smaller cars prevent them from offering as much passenger protection in every situation as larger cars. However, safety problems cannot adequately be defined or corrected until the smaller cars' performance on today's roads is determined. The Department of Transportation has done some studies, but it has never made a complete analysis using accident data. The Department should determine which smaller car safety issues need the greatest attention and what countermeasures can be used to reduce accidents, injuries, and fatalities.

General Accounting Office CED-82-29, HS-033 143, Apr. 1982, 77p, Tabs., Phots., Apps.

Acknowledgment: National Highway Traffic Safety Administration
Order From: GAO-Document Handling & Info Services Facility, P.O. Box 6015, Gaithersburg, Maryland, 20760

367677
ENERGY RELATED TO VEHICLE DESIGN

A review is presented of the effects of the oil crises of the 1970s and the present oil supply and price situation on the automotive industry. The future outlook and the view of Ford of Europe of the implication for future vehicle design are considered. Radical changes in powertrain technology and the possible abandonment of the reciprocating internal combustion engine are predicted. Gas turbines and electric-powered and hybrid vehicles are discussed as long-term alternatives to IC engines. Ford's sodium heat engine is introduced as a further long-term alternative. Nearer-term developments in the form of diesel engines, engine/transmission matching and electronics are examined and their impact on the family car of the 1990s is discussed.

Oldfield, JA (Ford of Europe) *International Journal of Vehicle Design* Vol. 3 No. 2, HS-033 144, May 1982, pp 131-141, 15 Fig., Phots.

Acknowledgment: National Highway Traffic Safety Administration
Order From: Inderscience Enterprises Limited, La Motte Chambers, St Helier, Jersey, England

367678

ENGINE MAPPING TECHNIQUES

This paper describes the engine mapping techniques in use by Ford in Europe in its campaign to improve automotive fuel economy in the face of increasingly difficult exhaust emissions regulations. These techniques, which are based on Ford US developments (Baker and Daby, 1977), provide the best possible fuel economy while meeting specified emission standards and minimising the loss of performance. The balancing of the many interrelated factors which influence performance, economy and emissions requires sophisticated computerised methods which encompass both "engine mapping" and "powertrain matching." In the following sections, the various steps involved in engine mapping are described, as well as the interactions with powertrain matching.

Barker, TD (Ford of Britain) *International Journal of Vehicle Design* Vol. 3 No. 2, HS-033 145, May 1982, pp 142-152, 1 Fig., 5 Ref.

Acknowledgment: National Highway Traffic Safety Administration
Order From: Inderscience Enterprises Limited, La Motte Chambers, St Helier, Jersey, England

367679

ADVANCED COMPOSITE MATERIALS

The use of lightweight composite materials to help improve vehicle fuel economy will need to be accomplished at minimal additional manufacturing cost. The versatility of composite materials lends itself to meeting the demands of this "material efficiency". The engineering design implications of the use of composites in vehicle components are reviewed, and the problems of manufacturing and processing of new materials are discussed. The failure and safety criteria of composites are considered, together with the prospects for future applications.

Rowbotham, EM (Ford of Europe) *International Journal of Vehicle Design* Vol. 3 No. 2, HS-033 146, May 1982, pp 153-159

Acknowledgment: National Highway Traffic Safety Administration
Order From: Inderscience Enterprises Limited, La Motte Chambers, St Helier, Jersey, England

367680

REDUCING THE AERODYNAMIC DRAG OF COMMERCIAL VEHICLES

Rising fuel costs in recent years have increased the importance of vehicle aerodynamic drag; even modest reductions can now show significant benefits in truck operating costs. Such potential benefits have prompted an extensive research programme aimed at reducing the drag of existing vehicles and defining the changes of shape needed for the next generation of fuel efficient vehicles. The results of wind tunnel tests on a variety of scale models are presented in order to identify both the problems of existing designs and the opportunities for improvement. The significant areas of interest are the cab/container geometry and the design of the container forebody, and studies are included concerned with methods of significantly varying the drag, usually by incorporating "add-on" devices. The problems of cross-wind drag characteristics are covered, together with measurements on the effectiveness of gap flow control and underbody modifications to improve the characteristics of the vehicle in yaw.

Garry, KP Stollery, JL (Cranfield Institute of Technology) *International Journal of Vehicle Design* Vol. 3 No. 2, HS-033 147, May 1982, pp 160-170, 9 Fig., 4 Ref.

Acknowledgment: National Highway Traffic Safety Administration
Order From: Inderscience Enterprises Limited, La Motte Chambers, St Helier, Jersey, England

367681

EVALUATION OF MOTOR VEHICLE HANDLING

Motor vehicle handling is evaluated in various stages from vehicle development to selection of vehicles by end users, and this evaluation work is performed for different purposes. This report is designed to identify common ideas, rating efforts, and problem areas in different stages of vehicle handling evaluation. Reference is also made to the course and future trend of studies for the evaluation of vehicle handling.

Sano, S (Honda R & D Company Limited) *International Journal of Vehicle Design* Vol. 3 No. 2, HS-033 148, May 1982, pp 171-189, 15 Fig., 6 Tab., 19 Ref.

Acknowledgment: National Highway Traffic Safety Administration
Order From: Inderscience Enterprises Limited, La Motte Chambers, St Helier, Jersey, England

367682

A KINEMATIC CONSTRAINT METHOD FOR STABILITY ANALYSIS OF ARTICULATED VEHICLES

This work examines a method of analyzing the handling response and stability of an articulated vehicle. The method consists of replacing the tyre force-slip angle relationships, that are typically used in handling analysis, with a kinematic constraint formulation. A vehicle model was analyzed using both the standard slip angle approach and the constraint method. The model examined is a simplified four degree-of-freedom model of a tractor-trailer system. The results of each analysis method are compared. These results indicate that use of the constraint method can afford greater ease in problem set up and solution and can eliminate the requirement for a tyre model. The results also indicate that the constraint method can provide an accurate estimate of tyre loading and vehicle stability boundaries.

Mooring, BW (Texas A&M University) Genin, J (New Mexico State University, Las Cruces) *International Journal of Vehicle Design* Vol. 3 No. 2, HS-033 149, May 1982, pp 190-201, 7 Fig., 2 Tab., 10 Ref.

Acknowledgment: National Highway Traffic Safety Administration
Order From: Inderscience Enterprises Limited, La Motte Chambers, St Helier, Jersey, England

367683

NUMERICAL SIMULATION OF DUMMY HEAD IMPACT TESTS ON STEERING WHEELS

This report presents the numerical simulation of dummy head impact tests on steering wheels. In the theoretical formulation, the motion of the dummy before impact is studied, and its result serves as the initial condition for the impact. During the impact the frictions existing between the dummy head and the steering wheel and at the pivot are considered in addition to the change of momentum due to impact force alone. The load vs. deflection curves of the steering wheels are simulated by three segments of straight lines for the elastic region before yield point, the region after the yield point and the unload region. The curve produced from the numerical calculation matches well with the impact data as presented in this report. The causes of high-frequency oscillation which appeared in the testing data are discussed.

Ying, S-J (South Florida University, Tampa) *International Journal of Vehicle Design* Vol. 3 No. 2, HS-033 150, May 1982, pp 234-242, 5 Fig.

Acknowledgment: National Highway Traffic Safety Administration
Order From: Inderscience Enterprises Limited, La Motte Chambers, St Helier, Jersey, England

367684

WHEEL HUB FORCES DUE TO VEHICLE ENCOUNTERING A BUMP

Forces transmitted to a vehicle suspension due to encountering a bump are measured during laboratory and track tests. The longitudinal (rearwards acting) loads are shown to be of significant magnitude when compared with the vertical components of the transient response. The implications of this on suspension design are discussed.

Harrison, HR Bassim, A (City University, London) *International Journal of Vehicle Design* Vol. 3 No. 2, HS-033 151, May 1982, pp 243-247, 5 Fig., 4 Ref.

Acknowledgment: National Highway Traffic Safety Administration
Order From: Inderscience Enterprises Limited, La Motte Chambers, St Helier, Jersey, England

Highway Safety Literature

367685

IN-TOWN DRIVING. SOMETHING YOU DO EVERDAY IS NOT SO SIMPLE AS IT APPEARS

This article written in a conversational tone, congratulates, the safe driver for proper intown driving while comparing the good driver's techniques with those of a third person, a poor driver, to illustrate that something that is done everyday is not as simple as it appears. Specific situations described include: traffic lights, patience in traffic, entering traffic, right turn on red, parking lots, lane changes, entering and leaving military bases, speed limits, mirrors, searching for addresses, and use of seat belts.

Driver Vol. 15 No. 12, HS-033 152, May 1982, 5p, Phots.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: US Air Force Inspection and Safety Center, Norton AFB, California, 92409

367686

IN AND OUT OF TIGHTSPOTS

This article is a multichoice quiz covering some particularly sticky situations that drivers can mentally put themselves into, at no risk to themselves or their vehicles. The accompanying answers give drivers valuable advice on getting out of tight spots that could turn into accidents. The article is written in a humorous conversational manner and addresses itself to the young inexperienced driver.

Driver Vol. 15 No. 12, HS-033 153, May 1982, pp 6-11, Phots.

ORDER FROM: US Air Force Inspection and Safety Center, Norton AFB, California, 92409

367687

ARE YOU UP ON TYRES. THE BACKYARD MECHANIC

This article discusses the proper treatment of automobile tires. It describes the proper method of checking tire pressure and the advantages and/or disavantages of under and over inflation. Correct tire inspection techniques are described including visual inspection for various tread wear patterns which can indicate misalignment, out-of-balance tire and wheel assembly, suspension neglect, lack of tire rotation, improper inflation, or improper brake adjustment. The article warns the driver to avoid objects which may cause internal tire damage, to avoid using wornout tires with less than 2/32 nds-inch of remaining tread depth, to avoid excessive speeds which create heat build-up in a tire, and to avoid excessive wheel spinning when freeing a vehicle from sand, mud, snow, gravel or ice.

Driver Vol. 15 No. 12, HS-033 154, May 1982, pp 22-25, Phots.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: US Air Force Inspection and Safety, Center, Norton AFB, California, 92409

367688

DRIVER'S VIEW OF THE ROADWAY

With the current movement toward a new roadway design practice that will be based on pavement luminance, it is useful to show the pavement luminance pattern in a representation that depicts the driver's viewpoint of the roadway. When such an arrangement is carefully prepared to scale and incorporates all the key contributing elements to the pavement luminance situation, the resulting diagram is very helpful in understanding the geometrical relationships that are factors in pavement luminance. This article points out the key ingredients to be included in the luminance diagrams, as well as items that are to be avoided. It then discusses methods to simplify the constraints involved in this contour plotting and how to convert 3-dimensional to 2-dimensional coordinates for an accurate perspective drawing. All calculations follow the CIE method as outlined in CIE Publication #30, "Calculation and measurement of luminance, and illuminance in road lighting," 1976. All outputs shown in this paper were prepared using a Hewlett Packard 1000 minicomputer with H-P's Graphic's Plotting System applied to the 9872 plotter.

Loch, CH *Illuminating Engineering Society, Journal of* Vol. 11 No. 2, HS-033 155, Jan. 1982, pp 121-127, 7 Fig., 5 Ref.

A paper presented at the Annual IES Conference, August 9 through 13, 1981, Toronto, Ontario, Canada. Author: ITT Outdoor Lighting, Southaven, Mississippi.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: Illuminating Engineering Society, 345 East 47th Street, New York, New York, 10017

367689

ROLE OF W.H.O. IN ROAD ACCIDENT PREVENTION

The role of the World Health Organization (WHO) in accident prevention, and information on major problems of general concern in many countries of the world faced with the consequences of rapid industrialization and motorization, are presented.

Romer, CJ (World Health Organization)
IRCOBI HS-033 157, Sept. 1981, pp 1-5

This paper was presented at the VIth International IRCOBI Conference on the Biomechanics of Impacts, held 8, 9, 10 September, 1981, Salon de Provence, France.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: IRCOBI Secretariat, 109 Avenue Salvador Allende, Bron 69500, France

367690

THE INFLUENCE OF TRAUMA UPON THE CERVICAL SPINE IN FUNCTION OF AGE AND SEX

Comparison of the mobility and the presence of pathological signs as osteophytosis, discopathia and olisthesis between two populations, one with traumatic history (traffic accident AIS=1) and one without traumatic antecedents. A radiological method is used. The influence of age is significant. The influence of sex upon mobility is clear. The used criteria made no significant difference between traumatic (AIS=1) and non traumatic population.

Tahon, P (Vrije Universiteit Brussels) Brombart, M (Universite Libre de Bruxelles) Poulet, B (Libre de Bruxelles Universite)
IRCOBI HS-033 158, Sept. 1981, pp 1-11, Tabs., 7 Ref.

This paper was presented at the VIth International IRCOBI Conference on Biomechanics of Impacts, held 8,9,10 September, 1981, Salon de Provence, France.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
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367691

THE SEVERITY ANDD CONSEQUENCES OF INJURIES IN URBAN TRAFFIC ACCIDENTS

As part of an in-depth accident study, information was collected on the nature and severity of the injuries sustained by all road users involved in a representative sample of accidents to which an ambulance was called in metropolitan Adelaide during a twelve-month period. The treatment received, duration of hospital stay, period of restricted activity and the characteristics of any residual permanent disability were recorded. These factors are presented in relation to the severity of the injury and discussed with respect to causal mechanisms and possible preventive measures.

McLean, AJ (Adelaide University, Australia)
IRCOBI HS-033 159, Sept. 1981, pp 12-19, 13 Tab., 6 Ref.

This paper was presented at the VIth International IRCOBI Conference on Biomechanics of Impacts, held 8,9,10 September, 1981, Salon de Provence, France.

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367692

PREDICTING PERMANENT PHYSICAL DISABILITY FOLLOWING ROAD-TRAFFIC-ACCIDENT TRAUMA

The objective of the present study is to examine the relationship between AIS-scores, estimated incapacitation and observed permanent physical disability among victims of road-traffic accidents. Whenever possible, the study will also investigate the effect of age.

Nielsen, HV Nordentoft, EL (Odense University Hospital, Denmark)
IRCOBI HS-033 160, Sept. 1981, pp 20-29, 2 Fig., 6 Tab., 3 Ref.

This paper was presented at the VIth International IRCOBI Conference on Biomechanics of Impacts, held 8,9,10 September, 1981, Salon de Provence, France.

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367693

STEERING WHEEL INDUCED HEAD AND FACIAL INJURIES AMONGST DRIVERS RESTRAINED BY SEAT BELTS

Many field studies of accidents have identified head and face impacts with the steering wheel as a predictable occurrence for the driver restrained by a lap-diagonal seat belt (1-8). The intentions of the present paper are two-fold. Firstly, it examines the frequency of such head strikes for seriously and fatally injured drivers using an accident sample that is demonstrated to be representative in terms of police reported variables of all accidents in a large study area. Secondly, the nature of the injuries resulting from such contacts are described to help indicate the types of injury tolerance data that are most applicable to this situation.

Gloyns, PF Rattenbury, SJ Rivlin, AZ Hayes, HRM Hanstead, JK Proctor, S (Birmingham University, England)
IRCOBI HS-033 161, Sept. 1981, pp 30-48, 2 Fig., 18 Tab., 28 Ref.

This paper was presented the VIth International IRCOBI Conference on Biomechanics of Impacts, held 8,9,10 September, 1981, Salon de Provence, France.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
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367694

CERVICAL SPINE INJURIES. EPIDEMIOLOGICAL INVESTIGATION, MEDICAL AND SOCIAL CONSEQUENCES

According to data from the registry maintained by the Danish National Health Service (Sundhedsstyrelsen) a little more than 200 persons are hospitalized annually in Demark because of cervical spine injuries sustained in road traffic accidents. Experiences from the Odense University Hospital show that not all injuries are reported to the national registry. According to the hospital registrations an estimate of 385 road traffic accident victims with cervical spine lesions should be hospitalized in Denmark annually and another 1050 should be treated as outpatients. 67.1% of the victims were front-seat car riders. The role of the classical whiplash injury is stressed by the fact that 46.5% of the patients with cervical spine lesions had been involved in rear-end collisions in opposition to 5.2% of the persons injured in all registered car collisons in Denmark in 1979. Although most injuries to the neck were graded as AIS 1 a follow-up investigation showed that even patients with this lesion only had long lasting complaints.

Juhl, M Seerup, KK (Odense University Hospital, Denmark)
IRCOBI HS-033 162, Sept. 1981, pp 49-58, 9 Tab., 6 Ref.

This paper was presented at the VIth International IRCOBI Conference on Biomechanics of Impacts, held 8, 9, 10 September, 1981, Salon de Provence, France.

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367695

COMPARISON OF RISK FOR RESTRAINED DRIVERS AND THEIR FRONT PASSENGER IN FRONTAL COLLISONS

The over-risk for the driver due to the steering system can be highlighted if drivers' state is compared with front passengers', provided no other significant side effects are involved, such as asymmetrical intrusion or rear over-loading. The comparison is made in a sample of 112 cars involved in frontal collision. No significant difference is observed between the proportion of severe injuries among drivers and passengers, but severe thoracic injuries are more frequent for passengers, severe injuries to lower members are more frequent for drivers. It cannot be affirmed that the steering system generates a manifest over-risk for drivers. Improving protection for front restrained occupants involved in frontal collisions will consist, for the main part, in better ride-down between restrained occupant and passenger compartment. That will result in reducing load on the thorax and frequency and seriousness of lower members contacts.

Henry, C Faverjon, G Thomas, C Tarriere, C Got, C Patel, A
IRCOBI HS-033 163, Sept. 1981, pp 59-69, 4 Fig., 4 Tab.

This paper was presented at the VIth International IRCOBI Conference on Biomechanics of Impacts, held 8,9,10 September, 1981, Salon de Provence, France.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
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367696

TRUCK ACCIDENT INVESTIGATION: ANALYSIS OF OCCUPANT INJURIES

This study involves trucks accidents investigation where occupants are injured. It has been made from the analysis of 51 accidents in which we found 59 occupants. These crashes are on an average very serious and usually the occupants are polytrauma injured; the main lesion being in the cephalic segment. We found main lesions either in case of frontal impact and rollover, or in case the cab is very collapsed. We concluded that the increase of occupants' safety during a crash involved either a better stiffness or a higher protection of the cab.

Quincy, R Ramet, M Uny, C
IRCOBI HS-033 164, Sept. 1981, pp 70-77, 5 Fig., 8 Tab., 6 Ref.

This paper was presented at the VIth International IRCOBI Conference on Biomechanics of Impacts, held 8,9,10 September 1981, Salon de Provence, France.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
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367697

CHARACTERISTICS OF NECK INJURIES OF CAR OCCUPANTS

Based on two independent accident studies of a 10 year research period with a total of 45,000 car accidents basic data on the occurrence of neck injuries are presented. The risk determination of neck injuries by frequency and severity for front, side and rear end crashes is analysed. The paper includes a review of literature and the results of neck injury occurrence are compared. The distribution of neck injuries with seating position, sex, age and the correlation of neck injury and overall injury severity is discussed. Results of the effect of head restraints and safety belts are presented.

Langwieder, K Hummel, T Sagerer, F
IRCOBI HS-033 165, Sept. 1981, pp 78-98, 16 Tab., 53 Ref.

This paper was presented at the VIth International IRCOBI Conference on Biomechanics of Impacts, held 8,9,10 September 1981, Salon de Provence, France.

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367698

INJURY INVESTIGATIONS IN ROAD ACCIDENTS: TYPOLOGY, FACTORS AND MECHANISMS AND MINOR LESIONS CHARACTERISTICS AIS MINUS OR EQUAL 3

An homogeneous sample of 262 injured persons were studied to find out: (1) The distribution of the injuries according to the AIS index; and (2) The inventory of injuries: (a) according to their own index of seriousness, (b) within the context of their lesional association and global OAIS index, (c) their distribution according to the corporeal segments, (d) according to the type of injury, (e) the role of the OAIS on the temporary industrial disablement and the hospitalization time, and (f) the role of the injured parts in establishing the index of seriousness.

Bourret, P Gastaud, R Orsoni, P (Centre Hospitalier General, Salon-de-Provence) Cavallero, C Cesari, D Ramet, M Quincy, R (O.N.S.E.R., France)
IRCOBI HS-033 166, Sept. 1981, pp 98-110, 10 Tab., Apps.

This paper was presented at the VIth International IRCOBI Conference on Biomechanics of Impacts, held 8,9,10 September 1981, Salon de Provence, France.

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367699

A STUDY OF TWO-WHEELED VEHICLE CASUALTIES TREATED AT A CITY HOSPITAL

This paper describes a sample of two-wheeled motor vehicle and pedal cycle accident casualties treated at a hospital in the city of Birmingham, England. Under reporting of two-wheeled vehicle accidents in national official statistics is shown and the possible reasons and implications of this finding are discussed. The patterns of injuries sustained by the 2 groups of casualties are described with comments on the likely reasons for the observed differences in their injury patterns. A comparison is drawn between the injuries sustained by the TWMV riders in this hospital study and a sample of fatally injured TWMV riders. Finally, the validity of the Treatment Period criteria of the Comprehensive Research Injury Scale is examined.

Pedder, JB Hagues, SB Mackay, GM (Birmingham University, England) Roberts, BJ (Birmingham Accident Hospital, England)
IRCOBI HS-033 167, Sept. 1981, pp 111-127, 10 Tab., 11 Ref., 2 App.

This paper was presented at the VIth International IRCOBI Conference on Biomechanics of Impacts, held 8,9,10 September, 1981, Salon-de-Provence, France. Session on Two Wheelers.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
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367700

CARBON DIOXIDE RETENTION INSIDE MOTOR-CYCLE HELMETS

The present study is divided intwo parts. In the first part, motorcycle helmets are tested in regard to carbon dioxide retention to determine whether the helmets meet the requirement concerning carbon dioxide concentration stipulated by the Swedish National Board of Occupational Safety and Health. In the second part, the interactive effects of an external dead space and exercise on the partial pressure of the carbon dioxide in the body on performance are studied.

Aldman, B (Chalmers University of Technology, Sweden) Balldin, U (Karolinska Institutet, Sweden) Gustafsson, H (The Folksam Group) Nygren, A (Karolinska Hospital, Sweden) Sporrong, A (Karolinska Institutet, Sweden) Astrand, I (National Board of Occupational Safety and Health)
IRCOBI HS-033 168, Sept. 1981, pp 128-137, 8 Fig., 1 Tab., 8 Ref.

This paper was presented at the VIth International IRCOBI Conference on Biomechanics of Impacts, held 8,9,10 September, 1981, Salon de Provence, France. Session on Two Wheelers.

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ORDER FROM: IRCOBI Secretariat, 109 Avenue Salvador Allende, Bron 69500, France

367701

THE SOUND ATTENTION AND THE AERODYNAMICALLY GENERATED NOISE INSIDE MOTOR CYCLE HELMETS

The aim of this study was to evaluate the attenuation of the sound when using a motorcycle helmet, and to measure the aerodynamically generated noise inside a helmet when driving. The possibility of detecting certain signals was judged, when masking and attention effects were taken into consideration.

Aldman, B (Chalmers University of Technology, Sweden) Gustafsson, H (The Folksam Group) Nygren, A (Karolinska Hospital) Johansson, B (Karolinska Institutet, Sweden) Wersall, J (Karolinska Hospital) Jonasson, H (National Institute for Materials Testing)
IRCOBI HS-033 169, Sept. 1981, pp 138-148, 6 Fig., 3 Tab., 8 Ref.

This paper was presented at the VIth International IRCOBI Conference on Biomechanics of Impacts, held 8,9,10 September 1981, Salon de Provence, France. Session on Two Wheelers.

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367702

TYPICAL INJURIES TO THE SOFT BODY PARTS AND FRACTURES OF THE MOTORIZED TWO-WHEELERS

224 accidents of motorized two-wheelers, involving 272 users, documented, reconstructed and analyzed within the framework of a research project by the Federal Highway Department (BAST, Cologne, West-Germany) are the basis of this survey. The project, carried out on the basis of field studies, has existed since 1973 at the Department of Trauma Surgery, Medical School Hannover. It is carried out in co-operation with the Institute of Automotive Engineering, Technical University Berlin. A team of accident surgeons, engineers, and psychologists collect data of traffic accidents. This comprehensive data is collected by direct approach of the accident scene and hospital, immediately after the event of accident. For this purpose special cars, equipped with blue light, radio and sirens, are at the disposal of the team. This data is not available by other means, such as files of the Statistical Federal Office and insurance companies. The methodical advantage is especially noticeable in two-wheeler accidents. They are rarely comprehensively documented by the police.

Otte, D Kalbe, P (Berlin Technical Univ, Inst of Automotive Eng) Suren, EG (Hannover Medical School)
IRCOBI HS-033 170, Sept. 1981, pp 148-165, Figs., Tabs., Refs.

This paper was presented at the VIth International IRCOBI Conference on Biomechanics of Impacts, held 8,9,10 September 1981, Salon de Provence, France. Session on Two Wheelers.

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367703

TRAUMA ASSESSMENT OF INJURIES AND THEIR CONSEQUENCES IN ACCIDENTS WITH TWO-WHEELERS

This investigation of the degree of injury, the clinical progress and the long term consequences of accidents involving motorbicycles represents a valuable supplement and extension of the data obtained by analysis of traffic accidents at the accident site by the Hannover Accident Research Unit. Although in the medical documents the type of accident is mostly inaccurately documented and soft tissue damage is not comprehensively described, the problematic nature of injury patterns can be estimated by considering the progress in typical cases. The data in this paper comes partly from records of 123 patients who were hospitalised in the Traumatology Department of the Hannover Medical School in 1978 and 1979 as a result of motorcycle accidents and partly from the files of the Hannover Accident Research Unit. In 59 cases additional information was obtained from answers to specially designed questionnaries.

Kalbe, P Suren, EG Otte, D Tscherne, H (Hannover Medical School) Appel, IH (Berlin Technical Univ, Inst of Automotive Eng)
IRCOBI HS-033 171, Sept. 1981, pp 166-175, 11 Tab., 10 Ref.

This paper was presented at the VIth International IRCOBI Conference on Biomechanics of Impacts, held 8,9,10 September 1981, Salon de Provence, France. Session on Two Wheelers.

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367704

CHARACTERISTICS OF OBJECTS STRUCK BY THE HEAD OF MOPED RIDERS OR MOTORCYCLISTS

On the basis of 293 moped and motorcycle accidents involving a head impact, the objects struck by the head have been classified according to their shape and estimated stiffness. Eight characteristic object parts were classified according to the frequency and severity of the head injuries recorded. The differences between the type of obstacles hit by moped riders and by motorcyclists were investigated from this standpoint. The distribution of the sites of impact on the head (or helmet) was also given. Cases of multiple impacts were analyzed separately. These data should help to improve the representative nature of the collision tests to which the two-wheelers' helmets would be submitted. The efficiency of the protection afforded by the helmet is not included in the scope of this study.

Vallee, H Thomas, C Sacreste, J Henry, C Tarriere, C (Peugeot S.A./Renault)
IRCOBI HS-033 172, Sept. 1981, pp 176-183, 3 Fig., 7 Tab., 4 Ref.

This paper was presented at the VIth International IRCOBI Conference on Biomechanics of Impacts, held 8,9,10 September 1981, Salon de Provence, France. Session on Two Wheelers.

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367705

SAFETY HELMETS SHELL MATERIAL AND HEAD INJURY INCIDENCE IN MOTORCYCLE ACCIDENTS

From an accident field study carried out in greater Munich area in 1980 a sample of 131 helmeted motorcyclists was investigated with respect to head injury incidence and the material of the shell of the safety helmets. Helmets made of Polycarbonate (PC), Acrylenitrile-Butadiene-Styrole (ABS), and Glass Reinforced Plastic (GRP) were represented in a sufficient number for evaluation. With respect to these shell materials, differences of head injury incidence were found, which in part proved significant. The observed degree of shell damage correlates not necessarily to the sustained head trauma.

Schuller, E Beier, G (Munich University, West Germany)
IRCOBI HS-033 173, Sept. 1981, pp 184-192, 10 Tab., 5 Ref., Apps.

This paper was presented at the VIth International IRCOBI Conference on Biomechanics of Impacts, held 8,9,10 September 1981, Salon de Provence, France. Session on Two Wheelers.

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367706

TWO WHEELERS ACCIDENTS: INJURY MECHANISMS AND MEANS OF PREVENTION

From 1976 to 1980, the O.N.S.E.R laboratory conducted three accident investigations concerning two wheelers. The first one analysed the data of 150 moped users involved in traffic accidents. The second one concerned 150 motor cyclist victims. The third one is focused on the behaviour of new helmets and takes into account 100 of two wheelers wearing a helmet and injured in traffic accidents. The results of these three studies are presented in this paper.

Ramet, M Cesari, D Dedoyan, A (O.N.S.E.R., France)
IRCOBI HS-033 174, Sept. 1981, pp 193-205, 3 Fig., 9 Tab.

This paper was presented at the VIth International IRCOBI Conference on Biomechanics of Impacts, held 8,9,10 September 181, Salon de Provence, France. Session on Two Wheelers.

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367707

LOWER LIMB INJURIES OF TWO WHEELERS

This paper examines the specific mechanisms of two-wheeled vehicles crashes producing lower limb injuries (these constitute about one third of all motorcycle accident injuries), and offers designs of protective devices for the lower limb.

Bourret, P Sejourne, P Orsoni, P (Salon de Provence Hospital) Cavallero, C (O.N.S.E.R., France)
IRCOBI HS-033 175, Sept. 1981, pp 206-218, 9 Fig., Apps.

This paper was presented at the VIth International IRCOBI Conference on Biomechanics of Impacts, held 8,9,10 September 1981, Salon de Provence, France. Session on Two Wheelers.

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367708

RECONSTRUCTION OF ACCIDENTS WITHIN THE FRAME OF JOINT BIOMECHANICAL RESEARCH PROJECTS

In September 1977, several European institutions joined together to establish the Joint Biomechanical Research Project (KOB) to study certain problems in the fields of passive safety, in particular the biomechanical processes important in this context. The objectives and the research programmes, the organization, the members and the funds were described at the IIId. International Conference on Impact Trauma, 1977. The research work has been finished in May 1981 and the final report will be available in the next months. The whole test programme included 18 reconstructions with 87 dummy-and 46 cadaver tests. Therefore it is quite clear, that this large research project has created a considerable amount of data and detailed results. In the following paper it is only possible to present a small view of the whole work and only some special results. This short version was prepared on the basis of a draft of the final report written by various authors.

Lenz, KH Friedel, B (German Federal Highway Research Institute)
IRCOBI HS-033 176, Sept. 1981, pp 219-224, 2 Ref.

This paper was presented at the VIth International IRCOBI Conference on Biomechanics of Impacts, held 8,9,10 September 1981, Salon de Provence, France. Session on Experimental Studies.

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367709

ON THE CALCULATION OF HEAD IMPACT MOTION USING EXPERIMENTAL DATA

Numerous head impact tests have been carried out by the Biomechanics department of the Highway Safety Research Institute, University of Michigan, Ann Arbor, during the past few years. The purpose of this work is to investigate the head motion during impact loading (the unloading phase is not considered) and especially to determine if the head slips on the impactor or rotates around it. Data from three different types of tests have been analysed: Front, side and rear impacts on human heads. The data consists of linear and angular accelerations and velocities for the head (considered as a rigid body). These four quantities are some of the most common that have been suggested as primary causes of injury. By using experimental data the position of the instantaneous point of rotation was determined as a function of time during impact loading. It was found that slip occurs between the impactor and the head with very few exceptions. It was also found that the human skull performs plane motion after front or rear impact. This is probably due to the symmetry around the midsagittal plane. In side impact on the human skull it was found that the motion is three-dimensional.

Gustafsson, G Karlsson, L (Lulea University, Sweden)
IRCOBI HS-033 177, Sept. 1981, pp 225-234, 8 Fig., 1 Tab., 2 Ref.

This paper was presented at the VIth International IRCOBI Conference on Biomechanics of Impacts, held 8,9,10 September, 1981, Salon de Provence, France. Session on Experimental Studies.

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367710

CLINICAL STUDIES ON LEG INJURIES IN CAR-PEDESTRIAN ACCIDENTS

This is a retrospective study of adult pedestrians injured by cars and treated at an orthopaedic department between January 1975 and June 1976. Medical records and police reports were used to analyse the accidents and to correlate the injuries to the impact areas of the vehicles. Clinical follow-up and interviews were made 1-3 years after the accidents. Special interest was focussed on such long term effect of the injuries to the lower extremity as the walking impairment caused by the impact of the bumper and the car front.

Bunketorp, O Romanus, B (Goteborg University, Sweden)
IRCOBI HS-033 178, Sept. 1981, pp 235-242, 3 Fig., 3 Tab., 8 Ref.

This paper was presented at the VIth International IRCOBI Conference on Biomechanics of Impacts, held 8,9,10 September, 1981, Salon de Provence, France. Session on Experimental Studies.

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367711

EXPERIMENTAL STUDIES ON LEG INJURIES IN CAR-PEDESTRIAN ACCIDENTS

A biomechancial model was used for experimental studies of leg injuries in car-pedestrian accidents. Human leg specimens including the hip joint were loaded by a concentrated body mass, balanced on an instrumented platform and impacted by a simulated car front mounted on a test cart. Injuries to the different parts of the leg specimens were analysed for various bumper levels, bumper lead angles, and bonnet edge heights at impact velocities 20-28 km/h. An energy absorbing and force limiting bumper was tested at 23 and 42 cm impact levels. A comparison is made of the injuries seen in real accidents and the possibility to mitigate these injuries by modifying the car front is discussed.

Bunketorp, O (Goteborg University, Sweden) Aldman, B (Chalmers University of Technology, Sweden) Jonson, R Romanus, B Roos, B (Goteborg University, Sweden) Thorngren, L (Chalmers University of Technology, Sweden)
IRCOBI HS-033 179, Sept. 1981, pp 243-255, 5 Fig., 5 Tab., 10 Ref.

This paper was presented at the VIth International IRCOBI Conference on Biomechanics of Impacts, held 8,9,10 September, 1981, Salon de Provence, France. Session on Experimental Studies.

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Highway Safety Literature

367712

EXPERIMENTAL STUDY OF THE AGGRESSIVENESS OF PARALLEL SLIDING DOORS ON THE UPPER LIMB

In the VAL transport system (Light automated vehicle for the urban transport system of the city of Lille) with a safety purpose in mind, the access to the vehicle has been made possible as it is for a lift thanks to a fully automatic drive and on account of the precision of stops in stations. The passengers are kept away from the track by a partition located at the platform edge and provided with sliding doors. The vehicle is equipped with similar sliding doors which come in front of those of the platform when the vehicle stops in the station. Under normal working conditions, the axes of vehicle and station doors coincide. However, an offset of 30 cm maximum between the vehicle and platform doors may be tolerated. In this case, the simultaneous closure of vehicle and station doors may induce a shearing type loading on the passenger remaining caught between. In particular, it could be thought that it would be the case for the upper limb mainly considering the space between door planes (about 20 cm) and the passenger behaviour when coming in and out. Bending forces, even slight, applied to elbow and wrist joints, induce important loadings which may result in isolated or associated lesions such as sprains, dislocations or fractures. Therefore, the injury risk for the passenger had to be assessed in this configuration to decide whether the device had to be modified before putting the vehicle into service.

Chapon, A Verriest, JP Trauchessec, R (O.N.S.E.R., France)
IRCOBI HS-033 180, Sept. 1981, pp 256-268, 8 Fig., 2 Tab.

This paper was presented at the VIth International IRCOBI Conference on Biomechanics of Impacts, held 8,9,10 September 1981, Salon de Provence, France. Session on Experimental Studies.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
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367713

SOME OBSERVATIONS ON LAMINATED GLASS WINDSCREENS AND THE INJURIES THEY CAUSE IN ACTUAL ROAD ACCIDENTS

This paper descirbes the results of a study aimed at examining the field performance of modern laminated windscreens in car accidents. It considers the nature of the head impacts with glass and the injuries sustained as a result. It also considers a number of other effects that have an influence on the impact performance of windscreens, such as pre-fracture, gasket separation and the position of initial contact. Consideration has been given to the insensitivity of the AIS for scaling minor and moderate soft tissue injuries. A Tissue Damage Scale has been developed to describe and scale the injuries to a finer degree than the AIS.

Mackay, GM Smith, CA (Birmingham University, England)
IRCOBI HS-033 181, Sept. 1981, pp 269-285, 1 Fig., 17 Tab., 6 Ref.

This paper was presented at the VIth International IRCOBI Conference on Biomechanics of Impacts, held 8,9,10 September 1981, Salon de Provence, France. Session on Experimental Studies.

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367714

HUMAN HEAD TOLERANCE TO IMPACT: INFLUENCE OF THE JERK (RATE OF ONSET OF LINEAR ACCELERATION) ON THE OCCURRENCE OF BRAIN INJURIES

Acceleration, S.I. and H.I.C. are parameters often considered in relation to head injuries produced by impact. This does not imply that any of these factors considered alone correlates very closely with the severity of the injuries. Do other parameters derived from a gamma (t) pulse, such as the acceleration jerk (d gamma/dt) for the same type of impact loading to the head, have any influence on the extent of injuries? The first objective of this communication is to synthesize experimental data concerning any possible influence of linear acceleration jerk of the head on the extent of the cerebral injuries produced by frontal head impact to freshly perfused and instrumented cadavers. The data obtained from these experiments, combined with that already obtained and published (2)(3)(4)(7) define the relationships between cerebral injuries and HIC values obtained by blows to the head without fracture of the skull.

Walfisch, G Fayon, A Chamouard, F (Peugeot S.A./Renault) Guillon, C Got, C Patel, A (Poincare Hospital, Garches) Hureau, J (Biomedical R.S.U., Saints-Peres) Tarriere, C (Peugeot S.A./Renault)
IRCOBI HS-033 182, Sept. 1981, pp 286-296, 5 Fig., 2 Tab., 12 Ref.

This paper was presented at the VIth International IRCOBI Conference on Biomechanics of Impacts, held 8,9,10 September 1981, Salon de Provence, France. Session on Experimental Studies.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
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367715

PREDICTION OF CHEST WALL DISPLACEMENT AND HEART INJURY FROM IMPACT CHARACTERISTICS OF A NON-PENETRATING PROJECTILE

Sternal injury, gross cardiac pathology and cardiac dysrhythmias following non-penetrating impact by a variety of impactors to the sternum of experimental animals are described. The biomechanical response of the chest wall to the impact are presented and a correlation between injury severity and chest wall displacement is demonstrated. A simple mathematical model is developed which predicts chest wall displacement when the mass, velocity and dimensions of the impactor are known. The model demonstrates the dependence of chest wall displacement on pre-impact kinetic energy, impactor diameter and target size.

Cooper, GJ Bexon, R Pearce, BP Stainer, MC Maynard, RL (Ministry of Defence, England)
IRCOBI HS-033 183, Sept. 1981, pp 297-312, 6 Fig., 3 Tab., 5 Ref.

This paper was presented at the VIth International IRCOBI Conference on Biomechanics of Impacts, held 8,9,10 September, 1981, Salon de Provence, France. Session on Experimental Studies.

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367716

VISUALISATION OF HEART MOVEMENT FOLLOWING NON-PENETRATING IMPACT USING CINE AND FLASH X-RAY

Previous experiments have demonstrated the relationship of the severity of heart injury following non-penetrating chest injury to the dynamic behaviour of the chest wall and the kinetics of the projectile (Ref 1). This paper describes a method designed to determine the 3-dimensional distortion and displacement of the heart within the thorax following mid-sternal impact. The method uses a combination of flash and high-speed cine X-radiography and implantation of silver spheres. An example of its use in assessing heart movement following non-penetrating chest impact is given.

Cooper, GJ Bexon, R Pearce, BP Stainer, MC Maynard, RL Taylor, DEM (Ministry of Defence, England)
IRCOBI HS-033 184, Sept. 1981, pp 313-320, 4 Fig., 4 Ref.

This paper was presented at the VIth International IRCOBI Conference on Biomechanics of Impacts, held 8,9,10 September, 1981, Salon de Provence, France. Session on Experimental Studies.

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367717

COMPARISON STUDY OF TWO 3-YEAR OLD CHILD DUMMIES (PART 572 AND P3) IN A HARNESS TYPE CHILD RESTRAINT SYSTEM.

The frontal crash response of the Part 572 3-year old child dummy in an American child restraint system was compared with that of a child cadaver in a previous study. In this study a new 3-year old dummy, the P3 which is prescribed in the ECE Regulation 44 was compared with both the behaviour of the Part 572 dummy and that of the cadaver. In addition the MADYMO mathematical crash victim simulation program was used in an extensive sensitivity study for detailed analysis of the differences between both dummies. Simulations were performed wth varied dummy characteristics like mass distribution and joint range of motions. Differences between both dummies and the cadaver were shown and explained by means of the results of the sensitivity study. The kinematical effect of the vertebral column of the cadaver was found to be simulated in a more realistic way by the P3 than by Part 572 dummy. Some recommendations on how to improve future child dummy design are given.

Wismans, J (Research Institute for Road Vehicles, TNO, Nethlds) Stalnaker, RL (Southwest Research Institute) Maltha, J

(Research Institute for Road Vehicles, TNO, Nethlds)
IRCOBI HS-033 185, Sept. 1981, pp 321-330, 4 Fig., 5 Tab., 5 Ref.

This paper was presented at the VIth International IRCOBI Conference on Biomechanics of Impacts held 8,9,10 September 1981, Salon de Provence, France. Session on Experimental Studies

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367718

APPLICATION OF A THREE-DIMENSIONAL MATHEMATICAL OCCUPANT MODEL FOR THE EVALUATION OF SIDE IMPACTS

A three-dimensional mathematical model for simulation of the human body crash dynamics was formulated, for which the general MADYMO CVS program package was used. This model is employed for the analysis of the side impact behaviour of two different dummies: the Part 572 50 percentile male dummy and the APROD 80 dummy. Model predictions for both dummies are compared with the results of lateral drop tests and rigid wall sled tests. It is concluded that the mathematical model gives a realistic prediction of kinematics, impact forces and accelerations. The influence oof the arm-shoulder assembly in loading the vehicle paddings and dummy ribcage is analysed.

Wismans, J Maltha, J (Research Institute for Road Vehicles, TNO, Nethlds)
IRCOBI HS-0333 186, Sept. 1981, pp 331-341, 10 Fig., 2 Tab., 20 Ref.

This paper was presented at the VIth International IRCOBI Conference on Biomechanics of Impacts, held 8,9,10 September, 1981, Salon de Provence, France. Session on Experimental Studies.

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367719

ANATOMICAL AND BIOMECHANICAL STUDY OF INJURIES OBSERVED DURING EXPERIMENTAL PEDESTRIAN-CAR COLLISONS

This study examines the impact in a pedestrian/car collision when the bumper comes into contact with the lower limbs, i.e. from below the middle thigh downwards. Two reference positions of the subject in relation to the vehicle were adopted: (1) the subject received the impact from the front and the two lower limbs were hit almost simultaneously and (2) the subject received the impact by smashing into the left lower limb. The subjects were fresh cadavers, close examination of the progression of the impact was filmed at 500 frames/second and the cadavers underwent a full medical examination, and X-rays and a complete autopsy after the simulated accidents.

Farisse, J Seriat-Gautier, B Dalmas, J Daou, N (Faculte de Medicine-Nord-Marseille) Bourret, P (Centre Hospitalier General, Salon-de-Provence) Cavallero, C Cesari, D (O.N.S.E.R., France) Ramet, M (O.N.S.E.R.-Bron) Billault, P Berthommier, M (Citroen-Velizy)
IRCOBI HS-033 187, Sept. 1981, pp 342-354, Figs., Apps.

This paper was presented at the VIth International IRCOBI Conference on Biomechanics of Impacts, held, 8,9,10 September 1981, Salon de Provence, France. Session on Experimental Studies

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367720

ANTHROPOMETRY AND TRAUMATOLOGY OF THE PELVIS OF CHILDREN

In the case of child road users the pelvis shows the lowest risk of injury compared to other body regions. Being also located near to the body's centre of gravity, the pelvis is particularly suitable for the diversion of mass forces. For this reason, an analysis will be given of the traumatology, the biomechanics and especially the anthropometry of the child's pelvis, taking the following items into consideration: (1) typical contact region of exterior road users under lateral load; (2) contact region of restrained passenger car occupants under frontal load; and (3) geometrically relevant construction in the case of anthropometric dummies. Using frontal (anterior-posterior) and lateral X-ray photographs of the pelvis with children-given by post mortem examinations-, the typical geometry of the pelvis depending on physiological age is deduced. In addition to this, these results are compared with data of anthropometric dummies. Furthermore, an analysis of the traumatology of the child's pelvis is carried out with regard to type, severity and risk of injuries based on in-depth single-case analyses of real road accidents. The aim of this is to improve the understanding of the special injury mechanisms of this body region respectively to round off the level of knowledge by describing the general biomechanics of the pelvis.

Sturtz, G (Daimler-Benz AG, Germany)
IRCOBI HS-033 188, Sept. 1981, pp 355-362, 4 Fig., 8 Ref.

This paper was presented at the VIth International IRCOBI Conference on Biomechanics of Impacts, held 8,9,10 September, 1981, Salon de Provence, France. Session on Experimental Studies.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
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367721

SOME ELEMENTS OF STUDIES CONCERNING THE RELATIVE EFFECTIVENESS OF LAMINATED WINDSCREENS

The elements of information presented here are extracted from studies made by the Evaluation Centre of the O.N.S.E.R. (National Center for Highway Safety), on behalf of the Road and Highway Traffic Department. These studies developed successively in three directins: (1) First of all, the objective chosen was to evaluate the primary safety concerns associated with untimely breaking of toughened windscreens (1973-74); (2) Then studies wre oriented toward the problem of eye injuries due to traffic accidents (1975-77); (3) Finally, a comparison between the effects of toughened windscreens and the effects of laminated windscreens was undertaken (1979-80).

Dural, H Filou, C
Organisme National De Securite Routiere HS-033 189, Sept. 1981, pp 1-11, Tabs., 2 Ref.

This paper was presented at the VIth International IRCOBI Conference on the Biomechanics of Impacts, held 8,9,10 September 1981, Salon de Provence, France.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
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367722

THE PROTECTIVE EFFECT OF DIFFERENT KINDS OF PROTECTIVE CLOTHING WORN BY MOTORCYCLISTS

Many articles have been written about motorcycle accidents. Accident investigations have been made to describe the injury panorama and to clarify the accident mechanism (ref 2,3). However, very little is written about the effect of different kinds of protective clothing. Feldcamp (ref 4) showed that severe injuries were diminished by the use of protective clothing from 52.9% to 28.1%. Riders without protective clothing had compound fractures three times more often than riders wearing protective clothing. Engstrom (ref 1) found that out of 39 persons equipped with protective clothing, none had injuries above the AIS-grade III. Neither did he find any serious open fractures among these patients. The aim of this study was to examine the use of different kinds of leather clothing and to evaluate the protective effect of such safety equipment.

Aldman, B (Chalmers University of Technology, Sweden) Cacciola, I (Traffic Safety Group) Gustafsson, H (The Folksam Insurance Group) Nygren, A Wersall, J (Karolinska Hospital)
IRCOBI HS-033 190, Sept. 1981, pp 1-9, 10 Fig., 1 Tab., 7 Ref.

This paper was presented at the VIth International IRCOBI Conference on the Biomechanics of Impacts, Salon de Provence, France. 8,9,10 September 1981.

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367723

BRAIN INJURY SCALING.

The aim of this paper is: (1) to describe the Abbreviated Injury Scale (AIS-80); (2) to describe the classification of brain injuries in the ICD system (International Classification of Diseases); (3) to present an improved classification; (4) to use the elements of this classification to design an injury scale; and (5) to compare the proposed injury scale with the AIS-80.

Stalhammar, D Holmgren, E Lindgren, S Lindstrom, L (Sahlgren's Hospital, Goteborg, Sweden)
IRCOBI HS-033 191, Sept. 1981, pp 1-8, 2 Fig., 6 Tab., 18 Ref.
Introduction to panel discussion at VIth International IRCOBI Conference on the Biomechanics of Impacts Salon de Provence, September 8-10, 1981.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: IRCOBI Secretariat, 109 Avenue Salvador Allende, Bron 69500, France

367902

WE'RE NOT IN BUSINESS TO DEREGULATE--PECK. THE FIRST OF A TWO-PART INTERVIEW WITH THE NATION'S TRAFFIC WATCH DOG

In this article, the first of a two-part interview series, Raymond A. Peck, Jr., Administrator of the National Highway Traffic Safety Administration (NHTSA), comments on his agency's past, present and future. This part of the interview focuses on the effect of the budget cuts on the Agency, the desire of Mr. Peck to repair the rift between the automobile industry and NHTSA, the issue of the Federal Motor Vehicle Safety Standards, and Mr. Peck's personal managerial style.

Brake and Front End Vol. 52 No. 4, HS-033 192, Apr. 1982, pp 34-42, Phots.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: Babcox Publications, Incorporated, 11 South Forge Street, Akron, Ohio, 44304

367903

TECHNOLOGY TO PSYCHOLOGY: PECK SHIFTS NHTSA ATTACK

This is the conclusion of a two-part interview with Raymond A. Peck, Jr., administrator of the National Highway Traffic Safety Administration. Mr. Peck now discusses future NHTSA plans and policies. On the issue of safety belts, NHTSA will focus on a behavior modification program rather than on technology. The program will have four integral elements: reach people, inform people, persuade people, and enforce and reinforce. There will probably not be a notice of rule making on high center-mounted brake lights, because the problem is more complex than anticipated. The Uniform Tire Quality Grading System investigation is not completed and research is being done on truck splash and spray and rear underride.

Brake and Front End Vol. 52 No. 5, HS-033 193, May 1982, pp 12-20, Phots.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: Babcox Publications, Incorporated, 11 South Forge Street, Akron, Ohio, 44304

367904

MOTOR REBUILDING SERIES. TEAR DOWN AND INSPECTION. ENGINE REBUILDING: PART ONE

This is the first part of a 3-part article on engine rebuilding. It covers disassembly, diagnosis/inspection and remachining-in this case, how to communicate your needs to the jobber machines shop. The article includes a series of 19 captioned photos.

Stenquist, P *Motor* Vol. 157 No. 5, HS-033 194, May 1982, 7p, Phots.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: Hearst Books, Motor Books Department, 224 West 57th Street, New York, New York, 10019

367905

BRAKING NEWS. DIAGONALLY SPLIT BRAKES, QUICK TAKE-UP MASTERS, AND LOW-DRAG CALIPERS ARE NOW STOPPING THE NEW GMS

General Motors X-cars, J-cars, and the new A-cars, use a brake system that incorporates a quick take-up master cylinder and low-drag front caliper design. The system also uses the diagonal split braking principle: The front brake on one side of the car, and the rear brake on the other side are served by the master cylinder primary piston. The remaining front and rear brakes are handled by the secondary piston. All the other cars in the GM lineup except the Corvette and T-cars use a front/rear split braking system with quick take-up master cylinders and low-drag front calipers. This article explains the operation of this brake system and includes 2 series of captioned photos: Caliper Rebuild and Master Cylinder Rebuild.

Gromer, C *Motor* Vol. 157 No. 5, HS-033 195, May 1982, 6p, Phots.
ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: Hearst Books, Motor Books Department, 224 West 57th Street, New York, New York, 10019

367906

A DRIVER BASED STUDY OF FREEWAY CONSTRUCTION LANE CLOSURES

This paper focuses on the areas of merge and speed control at four-lane rural freeway lane closures. The following issues are addressed: (1) Investigation of the merits of implementing reduced speed limits; (2) Investigation of the impact of different (real and hypothetical) merging strategies on the standard deviation of the speed distribution at the beginning of the taper; and (3) Effectiveness of the standard construction zone traffic control devices in promoting early merge.

Rouphail, NM (Illinois University, Chicago) Nemeth, ZA (Ohio State University) *ITE Journal* Vol. 52 No. 6, HS-033 196, June 1982, pp 18-21, 1 Fig., 2 Tab., 2 Phot., 11 Ref.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: Institute of Transportation Engineers, 525 School Street, SW, Suite 410, Washington, D.C., 20024

367907

THE EFFECTS OF TRUCK SIZE ON DRIVER BEHAVIOR

This report discusses the effects of truck size on the behavior of drivers who interact with trucks in selected roadway situations. Specifically, truck length/configuration was addressed in a freeway entrance merge, mainline lane change, and narrow bridge situations while truck width was studied in a rural two-lane, two-way passing situation. Field work involved the collection of microscopic traffic measures via the Traffic Evaluator System in addition to observations of erratic maneuvers and truck type for the length/configuration studies. Length/configuration had little or no effect on interacting drivers as judged from the data available. The truck/width passing study employed an impedance factor to induce passing of an experimentally widened vehicle. Increasing truck width was found to be conducive to increased prepass headways, reduced lateral distance between passers (overtaking and oncoming) and the truck, and reduced lateral distance between oncomers and the road edge. However, no increases in shoulder encroachments by passers or acceptances of small gaps were found.

Seguin, EL Crowley, KW Harrison, PC, Jr Perchonok, K
Institute for Research, Federal Highway Administration, Biotechnology, Incorporated Final Rpt. FHWA-RD-81-170, HS-033 198, Mar. 1982, 138p, 21 Fig., 43 Tab., Apps.
Contract DOT-FH-11-9155

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
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367909

INSURANCE LOSSES, THEFT COVERAGES. PASSENGER CARS, VANS, PICKUPS, AND UTILITY VEHICLES. RESERCH REPORT

This Highway Loss Data Institute report describes variations in both the frequency and size of insurance theft losses involving 1979, 1980, and 1981 model year passenger cars, vans, pickups, and utility vehicles. The principal findings for passenger cars are: (1) There were huge variations in the theft loss experience of different cars. The car with the worst experience had theft losses that were more than 400 times greater than the losses for the car with the best results; (2) Among the individual series summarized, the Chevrolet Corvette had the worst theft loss experience in all three model years. The 1981 two-door Plymouth Horizon and four-door Pontiac Phoenix had the best results; (3) There were large differences in theft results even among cars of similar size and body style. For example, relative average loss payments per insured vehicle year ranged from 16 to 197 for 1979 intermediate size four-door models; (4) Sports and specialty models had the worst theft losses. For 1981 models, they accounted for only 15 percent of the exposure but 51 percent of the total dollars paid out; (5) Station wagons had the lowest theft losses. Generally, larger cars had higher theft losses than similarly styled smaller cars; (6) Average theft claim sizes ranged from less than $200 to over $4,000 for 1981 models; (7) The theft loss results were consistent from one model year to another; (8) Decreases in theft claim frequencies for the more recent model years were more than offset by increases of over 30 percent in average loss payments per claim for each successive model year; (9) Claim frequencies declined for each successive year the 1979 models were in use, but did not for 1980 models; and (10) The frequency of theft claims involving large cars declined sharply between 1979 and 1980 models. The principal findings for vans, pickups, and utility vehicles are: (1) Vans, standard pickups, and small and intermediate-sized utility vehicles all had higher theft losses than cars of the same model year; (2) The Ford Bronco had the highest average loss payment per claim and highest average loss payment per insured vehicle year for 1979 and 1980 models; (3) The Jeep CJ-5 had the highest frequency of theft claims for 1979 and 1980 models; and (4) The Plymouth Arrow pickup had the lowest average payment per insured vehicle year for 1979 and 1980 models.

Highway Loss Data Institute HLDI T81-1, HS-033 200, May 1982, 47p, 2 Fig., 11 Tab.

Report covers 1981 models during their first year, 1980 models during their first two years and 1979 models during their first three years.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: Highway Loss Data Institute, Watergate 600, Washington, D.C., 20037

367910

THE U.S. AUTOMOBILE INDUSTRY, 1981. REPORT TO THE CONGRESS FROM THE SECRETARY OF TRANSPORTATION

The Chrysler Corporation Loan Guarantee Act (PL 95-185) requires the Secretary of Transportation to prepare and submit to Congress an annual assessment of the U.S. automobile industry. The first report, The U.S. Automobile Industry, 1980, discussed many of the basic causes of the problems faced by the industry. This report deals with developments during 1981 and with future prospects for the industry.

Office of the Secretary of Transportation, Transportation Systems Center DOT-P-10-82-01, HS-033 201, May 1982, 60p, 9 Fig., Tabs.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: GPO

367911

PROGRESS REPORT ON INCREASING CHILD RESTRAINT USAGE THROUGH LOCAL EDUCATION AND DISTRIBUTION PROGRAMS

North Carolina statistics indicate that, as in the past, automobile accidents continue to be the leading cause of death to children. Dynamically tested child safety seats could save the lives of at least 80 out of 100 children killed if parents would buckle their children up. Unfortunately, nine out of every ten children involved in North Carolina crashes are not protected by restraints. A countermeasure was instituted in 1977 in which the North Carolina Governor's Highway Safety Program and the University of North Carolina Highway Safety Research Center began an education oriented project to educate parents through health care professionals. Since 1977, these efforts have been expanded to include community groups and to assist in setting up local loaner/rental programs and programs designed to protect foster children in each county. This year's efforts have been characterized by expansion into various areas of child passenger safety. In efforts to meet project goals, efforts have been concentrated in three main areas; education, distribution, and legislation. This report will consist of efforts expended in the following basic components: (1) An educational program aimed primarily at health care providers and educators; (2) A restraint distribution program setting up local restraint loaner/rental programs; (3) An expansion of local "Wards of the State" programs; (4) Expanded efforts in development of child restraint legislation; and (5) The continued evaluation of the effectiveness of the project.

Hall, WL Orr, BT Council, FM Trinkoff, AM Daniel, RB Waller, AE
North Carolina University HS-033 202, Nov. 1981, v.p., 3 Fig., 9 Tab., 6 Ref., Apps.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: North Carolina University, Highway Safety Research Center, Chapel Hill, North Carolina, 27514

367912

WISCONSIN ACCIDENT FACTS 1981

Table of Contents: Facts and Figures; Economic Loss; Reporting Agency; 10 Year Summaries; Accidents by Highway Class-Rural; Accidents by Month; Fatal Accidents by Month; Types of Motor Vehicle Accidents; Blood Alcohol Content of Driver Fatalities; Accidents by Highway System and County; Accidents by County and Severity; Holiday Fatal Accidents and Fatal Accidents by Month; Environmental Conditions; Types of Motor Vehicles; Time of Occurrence; Age of Drivers; All Drinking Drivers and Pedestrians; Drinking Drivers and Pedestrians (Ability Impaired); Possible Contributing Circumstances; Motorcycle Accidents; Motorcycle Graph; Person Killed and Injured by Age and Type of Accident; Pedestrians Killed and Injured; Persons Killed and Injured by Age-Type of Person and Sex; Economic Loss by Severity-Urban by Population; and Graph on Speed Citations and Possible Contributing Circumstances of Speed.

Wisconsin Department of Transportation HS-033 203, 1982, 32p, Tabs.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: Wisconsin Department of Transportation, Accident Data Section, Room 694, P.O. Box 7917, Madison, Wisconsin, 53707

367913

EFFECTS OF A SELECTIVE TRAFFIC ENFORCEMENT PROGRAM ON SEAT BELT USAGE

A study was conducted to assess the effect of a Selective Traffic Enforcement Program on seat belt usage. The program consisted of increased enforcement of the seat belt legislation and publication of this enforcement. It was predicted that during the program, there would be increases in seat belt usage and subjective probability of being apprehended in the experimental city, whereas there would be no changes in these variables in the control city. Seat belt usage (N equals 23,910) and telephone (N equals 1,738) surveys were conducted before, during, 1 month after, and 6 months after the program in both cities. In the experimental city observed belt usage increased from 58% to 80% during the program, dropping to 70% 6 months after the program. Reported belt use and subjective probability also increased during the program. In the control city an increase in subjective probability was observed, but there was no increase in belt usage noted. The role of subjective probability as a mediator of the effect of enforcement on driver behavior is discussed.

Jonah, BA Dawson, NE Smith, GA (Transport Canada, Ottawa)
Journal of Applied Psychology Vol. 67 No. 1, HS-033 204, Feb. 1982, pp 89-96, 3 Tab., Refs.

Requests for reprints should be sent to Brian A. Jones, Road Safety Branch, Transport Canada.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: Transport Canada, Road Safety Branch, Place de Ville, Ottawa K1A 0N5, Canada

367914

A BALANCED PLACEBO INVESTIGATION OF THE EFFECTS OF ALCOHOL VS. ALCOHOL EXPECTANCY ON SIMULATED DRIVING BEHAVIOR

The present investigation employed a balanced placebo design to examine the effects of alcohol versus the belief that one has consumed alcohol, i.e., alcohol expectancy, on error production while operating a driving simulator. The male subjects employed were social drinkers, having no history of alcohol abuse. The alcoholic beverage consisted of vodka and tonic in the ratio of 1:5, resulting in a mean blood alcohol level of .064%. The placebo beverage consisted of water and tonic, also in the ratio 1:5. Principal findings were that alcohol ingestion had a debilitating effect on certain measures of driving behavior (operation of brakes, steering), whereas the belief that one had consumed alcohol had no discernable effects. The results are discussed in relation to other findings using the balanced placebo design. It was concluded that reckless driving under the influence of alcohol, is at least partly a result of the pharmological effects of ethanol.

Rimm, DC Sininger, RA Faherty, JD Whitley, MD Perl, MB *Addictive Behaviors* Vol. 7 No. 1, HS-033 205, 1982, pp 27-32, 8 Ref.

Requests for reprints should be sent to D.C. Rimm, North Texas State University.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: North Texas State University, Dept. of Psychology, Denton, Texas, 76203

367915

DRINK-DRIVING RESEARCH IN NEW ZEALAND

Drink-driving research in New Zealand is briefly analyzed with reference to traffic accidents. Claims about drinking, driving and accidents which have currency in New Zealand at present are appraised. It is shown that many factors are involved in traffic accidents, and the problems in their causation are highly complex. Alcohol is only one of many factors present in accidents. It is involved in less than half of all injury-producing accidents. Much of its involvement in traffic accidents is of a spurious rather than a causal nature. Yet the focus of countermeausres against traffic accidents is drinking and driving. These countermeasures are ineffective.

Stacey, BG Lonsdale, CJ (Canterbury University, New Zealand) *Perceptual and Motor Skills* Vol. 54 No. 1, HS-033 206, Feb. 1982, pp 87-90, 8 Ref.

A full copy of the research report may be also obtained from Dr. B.G. Stacey, University of Canterbury, New Zealand.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: Microfiche Publications, P.O. Box 3513, Grand Central Station, New York, New York, 10017

367916

VISUAL CONTROL DURING STRAIGHT ROAD DRIVING

In a laboratory experiment, visual thresholds were determined for change in heading angle and change in lateral position during simulated straight road driving. These thresholds differ for different delineations, forward speeds and exposure durations. The thresholds as found are low enough to be compatible with the precision with which a driver actually keeps course on a straight road. Therefore, they are likely candidates as visual cues for course control by a driver. Some implications for future research are discussed.

Riemersma, JBJ (Institute for Perception RVO-TNO) *Acta Psychologica* Vol. 48 No. 1-3, HS-033 207, Aug. 1981, pp 215-225, 4 Fig., 1 Tab., Refs.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: North-Holland Publishing Company, P.O. Box 211, Amsterdam, Netherlands

367917

DRIVING WHILE UNDER THE INFLUENCE OF ALCOHOL: RELATIONSHIP TO ATTITUDES AND BELIEFS IN A COLLEGE POPULATION

Two social psychological theories (the Fishbein Model and the Health Belief Model) were used to derive attitude and belief factors to predict intentions to drive while under the influence of alcohol and actual drinking-driving behavior in a college population. The results revealed strong support for the Fishbein theory; attitudes and normative beliefs predicted intentions, while intentions were the best predictor of subsequent behavior. From the Health Belief Model, specific beliefs regarding one's effectiveness at being able to avoid getting caught by the police and cause an accident while driving under the influence of alcohol were also significantly related to drinking-driving intentions and behavior. These findings indicate that decisions to drink and drive are the result of one's personal evaluation of this behavior and one's perceived ability to control the threatening consequences. Thus drinking and driving may continue to be so prevalent in a college population because they erroneously believe that they are still safe drivers and effective at controlling the attendant risks.

Beck, KH (Maryland University) *American Journal of Drug and Alcohol Abuse* Vol. 8 No. 3, HS-033 208, 1981, pp 377-388, 3 Tab., 15 Ref.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: Marcel Dekker Journals, 270 Madison Avenue, New York, New York, 10016

367919

LEVELS OF STEERING CONTROL: REPRODUCTION OF STEERING WHEEL MOVEMENTS

A schematic description of the driving control process is presented. It is shown that this process can be described in terms of levels of control i.e. precognitive, pursuit and compensatory. Level of control will depend on driver's skill in making use of "clever" strategies which may be related to knowledge about the path to follow (input) and/or the vehicle under control. This knowledge may be referred to as an internal model of a particular task element. Internal information, as derived from these internal models will probably be used together with proprioceptive feedback. It is hypothesized that the efficiency of the higher levels of control will depend on the accuracy of both the internal and proprioceptive information. Based on this research philosophy a series of experiments is carried out.

Godthelp, J
Institute for Perception RVO-TNO IZF 1980-16, HS-033 211, 1980, 30p, 9 Fig., 8 Tab., 11 Ref.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: Institute for Perception RVO-TNO, Kampweg 5, Soesterberg, Netherlands

367920

CYBERNETICS AND CAR DRIVING: A DRIVER MODEL AND ITS EXPERIMENTAL VALIDATION

For the use of cybernetical models to describe and predict driver behavior quantitatively a proposal is made for a supervisory control model based on the well-known optimal control model. In the model some elements are distinguished which suit well with the ideas from experimental psychology. An extension to the model is given by introducing elements related to future values of the lead variables, like the course of the road, to permit a description of driver anticipation in specific tasks. A proposal is given for an experimental validation of this model by hypothesizing effects of experimental variables (time over which future values are observable, task accuracy, driving experience, etc.) on specific elements of the model structure.

Blaauw, GJ
Instituut voor Zintuigfysiologie TNO IZF 1980-13, HS-033 212, 1980, 11p, 2 Fig., 1 Tab., 15 Ref.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: Instituut voor Zintuigfysiologie TNO, Kampweg 5, Postbus 23, Soesterberg, Netherlands

367921

CYBERNETICS AND CAR DRIVING: PERSPECTIVE PERCEPTION AND THE OUTPUT VECTOR OF THE SYSTEM TO BE CONTROLLED

This report deals with a sensitivity analysis for the perspective perception of lateral position variations during course-following and distance variations during car-following. Variations in the curvature of the road to be followed are also considered via a perspective transformation. The sensitivities are derived for the development of a cybernetical model to describe and predict driver behavior quantitatively. The lateral position variations and the variations in the distance to a lead car form the only elements of the system state vector which are thought to be transformed by the perspective perception. The curvature variations are related to the most substantial element of the lead vector. The sensitivity for lateral position variations distinguishes between several guidance features on a straight road: lane markers, postmounted delineators, public lighting, etc. The relative importance of each type is given. The sensitivities for distance variations are related to the angular perception of the lead car dimensions and the road interval between lead car and own vehicle. The derived transformation equations are combined into one "display" equation which represents the transformation of the variables involved in the system to be controlled and models the output vector of that system as input information for the driver.

Blaauw, GJ
Institute for Perception RVO-TNO IZF 1980-19, HS-033 213, 1980, v.p., 7 Fig., 1 Tab., 11 Ref., Apps.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: Institute for Perception RVO-TNO, Kampweg 5, Soesterberg, Netherlands

367922
TROUBLE SHOOTING HITCHES
This article explains the function of a load-distributing or "equalizer" hitch used on most tow vehicles. It explains also how to see if the hitch is installed and adjusted properly and what to do if the ball mount is in improper position or if the spring bar is improperly adjusted.

Estes, B *Trailer Life* Vol. 42 No. 7, HS-033 215, July 1982, 3p, Phots.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: Trailer Life Publishing Company, Incorporated, 23945 Craftsman Road, Calabasas, California, 92132

367923
CHEVY BLAZER
This article examines the 1982 diesel/overdrive Chevrolet Blazer. It compares its fuel consumption driving solo and towing a 5120-pound trailer. It then compares its performance to that of the same 6.2-liter diesel engine in a Suburban. The article includes several inserts: Performance and specifications of the 1982 Chevrolet Blazer, 6.2-liter Diesel Trailer-Towing limits by GCWR (gross combined weight rating) and GM's four-speed overdrive transmission.

Estes, B *Trailer Life* Vol. 42 No. 7, HS-033 216, July 1982, pp 78-82, Figs., Tabs., Phots.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: Trailer Life Publishing Company, Incorporated, 23945 Craftsman Road, Calabasas, California, 92132

367924
HITCH PITCH
This article intended for the businessman/mechanic, focuses on the selection of the proper size hitch, its installation, the connection of the trailer lighting system to the car (a schematic is included), the function of electric and surge trailer brakes, fifth-wheel-type hitches for RV trailers and engine cooling. It indicates that most rules and regulations pertaining to trailering equipment are defined in Regulation V-5, published by the federally chartered Vehicle Equipment and Safety Commission. A list of manufacturers is included.

Cerullo, B *Motor* Vol. 157 No. 6, HS-033 217, June 1982, 5p, Phots.
To obtain a copy of Regulation V-5 "Minimum Requirements for Motor Vehicle Connecting Devices and Towing Methods", write to Suite 802, 4660 Kenmore Avenue, Alexandria, Virginia, 22304

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: Hearst Books, Motor Books Department, 224 West 57th Street, New York, New York, 10019

367925
DRINKING PRACTICES AMONG URBAN ADULTS IN ISRAEL. A CROSS-CULTURAL COMPARISON
This article reports what is believed to be the first epidemiological data on drinking practices of Israeli adults, men and women. These data document a low prevalence of drinking in Israel. The contrast between Israel and the United States on various indicators of drinking, whether lifetime prevalence, usage within the last year, or usage within the last month, is striking. The differences in frequencies and quantities of drinking are also large. These data confirm the existence of the cross-cultural differences in drinking inferred from indirect indicators. Of the two interpretations that have been advanced to explain the absence of extensive drinking among Jews, one seems to be confirmed by the data. A direct relationship was found between religious orthodoxy and drinking experience, and an inverse relationship with frequency of drinking.

Kandel, DB Sudit, M *Journal of Studies on Alcohol* Vol. 43 No. 1, HS-033 218, Jan. 1982, pp 1-16, 9 Tab., 17 Ref.
Reprint requests to Dr. Kandel, Department of Psychiatry, Columbia University.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: Columbia University, New York, Department of Psychiatry, 722 West 168th Street, New York, New York, 10032

367926
CYBERNETICS AND CAR DRIVING: A MATHEMATICAL (COMPUTER) MODEL FOR THE SYSTEM TO BE CONTROLLED
For the use of cybernetical models to describe and predict driver behavior quantitatively it is first necessary to develop a mathematical description for the system to be controlled. In this context the system might be defined by combinations of lateral and longitudinal vehicle dynamics, course-following, car-following and the execution of an arbitrary additional task. For the system description a linearized model is developed and implemented in a number of subroutines on a digital computer. The model is based on the modern control theory in the time domain and uses state vector notation. The description results in a six-dimensional state vector and involves three lead variables (course of the road, velocity of the lead car and the stimulus of the additional task) and one disturbance variable (side-wind gusts or road-way irregularities). The routines calculate future values for the course of the road and the velocity of the lead car in order to make anticipation possible by the driver. Driver's actions are modelled by the position of the accelerator, the brake force and the steering-wheel angle. Several routines are extended with additional procedures to allow for an independent use in other applications. For example, the mathematical representation of the vehicle dynamics is extended with non-linear equations to cover the complete range of variables and may be used in specific studies of the effects of vehicle parameters.

Blaauw, GJ
Institute for Perception RVO-TNO IZF 1980-4, HS-033 219, 1980, 24p, 1 Fig., 5 Ref., Apps.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: Institute for Perception RVO-TNO, Kampweg 5, Soesterberg, Netherlands

367927
DRIVER AND RIDER EDUCATION, TRAINING AND LICENSING: A BRIEF REVIEW
Relevant research related issues are briefly examined. The known influence of experience implies the possibility of effective education and training. At present, however, there is no sound evidence to show that effective programmes exist, to support the suspicion of a special effectiveness for motorcyclists, or to suggest that a licence test is an effective crash countermeasure--either as a selection device or as an incentive for prelicensing education. Great expenditure on fairly ineffective measures results in loss of opportunity to benefit from more effective, mainly engineering, measures. Longer term driver behaviour research seems to have a high priority.

Saffron, DG
Traffic Authority of New South Wales Res. Rpt. TARU 4/81, HS-033 220, Nov. 1981, 33p, Refs.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: Traffic Authority of New South Wales, 56 Rothschild Avenue, Traffic Accident Research Unit, Roseberry, New South Wales 2018, Australia

367928
SELECTED LEGAL ISSUES IN CHEMICAL TESTS FOR INTOXICATION AND IMPLIED CONSENT--PLUS UPDATE ON SELECTED ALCOHOL RELATED CASES
This paper reviews current court cases and decisions made regarding selected legal issues in chemical tests for intoxication and implied consent. The first half of the paper consists of three parts as follows: Part I--Taking of blood sample on probable cause and exigent circumstances (focus on narrow issue of whether a blood sample may be taken by the prosecution under the Fourth Amendment with only probable cause and exigent circumstances); Part II--Unconscious or persons incapable of refusal--Refusal later; and Part III--Saving sample of breath for later analysis by defendent. The last half of this paper is an update on selected alcohol related cases presented in outline form.

Reeder, RH
Northwestern University, Evanston, National Highway Traffic Safety Administration HS-033 221, Feb. 1982, pp 1-25, 2 Ref.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration
ORDER FROM: Northwestern University, Evanston, Traffic Institute, Evanston, Illinois, 60201

367929

THE DEVELOPMENT AND EVALUATION OF A PROTOTYPE GRADE SEVERITY RATING SYSTEM

This report summarizes a study to evaluate techniques for reducing the incidence and severity of truck downgrade accidents. It includes a description of an improved version of a grade severity rating model, and detailed instructions for using it to determine a recommended maximum grade descent speed for each of several truck weight ranges on any given grade. These maximum recommended speeds could be posted on a weight-specific speed (WSS) sign at the beginning of a grade. This would enable truck drivers to descend the grade in a safe manner without guesswork in selecting a speed. Additional driver simulator and field tests of the weight-specific speed signs format will be carried out to determine the most effective WSS sign. Other tasks that were carried out on this study and reported herein are to develop a means for determining the cost-effectiveness of alternative techniques, to evaluate the cost-effectiveness of alternative techniques, and to determine criteria for deployment of the techniques. Full-scale field tests as well as a simulation in a fixed-base truck simulator were used in carrying out these tasks. Examples of the techniques considered included several types of signing, a grade severity rating system, and truck escape ramps.

Johnson, WA DiMarco, RJ Allen, RW
Systems Technology, Incorporated, Federal Highway Administration, (TR-1121-1) Final Rpt. FHWA-RD-81-185, HS-033 223, Mar. 1982, 184p, 52 Fig., 13 Tab., Refs., Apps.
Contract DOT-FH-11-9356

Acknowledgment: National Highway Traffic Safety Administration
Order From: NTIS

367930

1980 MOTOR VEHICLE COST RESPONSIBILITY STUDY. SUMMARY REPORT

This report presents the findings and recommendations of a study which examined the two groups of users of the Oregon state highway system to determine what their proportion of road user taxes should be to maintain equity between the two groups. The two groups are: Basic vehicles--autos and smaller load-carrying vehicles weighing 8,000 pounds or less; and Heavy vehicles--trucks and buses weighing over 8,000 pounds. Among the major findings were that basic vehicles should contribute 55 percent of road user revenue and heavy vehicles 45 percent, by 1983 at current tax rates basic vehicles will contribute 55.7 percent and heavy vehicles 44.3 percent, and increases in expenditures for highway deterioration prevention will result in a higher cost responsibility share for heavy vehicles.

Oregon Department of Transportation HS-033 224, Feb. 1981, 22p, 2 Fig., 5 Tab.

This report was prepared for the Sixty-first Legislative Assembley At the Request of the Senate Trade and Economic Development Committee of the Sixtieth Legislative Assembly.

Acknowledgment: National Highway Traffic Safety Administration
Order From: Oregon Department of Transportation, Highway Planning Section, Economic Services Unit, Salem, Oregon, 97310

367931

AUTOMOTIVE TROUBLE-SHOOTING QUIZ

This quiz on auto maintenance consists of four questions and four answers: What is the problem when: (a) the water-temperature light glows intermittently; (b) the engine hesitates when it's cold; (c) the tires squeal when turning; and (d) the engine losses power at cruising speed.

Mercaldo, S *Popular Science* Vol. 221 No. 1, HS-033 225, July 1982, pp 105-108, Phots.

Acknowledgment: National Highway Traffic Safety Administration
Order From: Times Mirror Magazines, Incorporated, 380 Madison Avenue, New York, New York, 10017

367932

IS IT A CREAMPUFF OR A CLUNKER?

With skyrocketing new-car costs and high interest rates, more people are buying used cars than ever before. After reviewing briefly the situation at local dealers, this article gives advice on how to find a good used car: Late-model cars generally make the best buys because new cars depreciate faster than old ones; gas-guzzlers should not be ignored; unpopular styles and colors can often mean good buys; and it is not the car's mileage that's important, but the way it has been driven. The article includes a brief review of used-car sales regulations in Maryland, Virginia and the District of Columbia and two inserts "The '78 Cars That Have Held Their Value Best--and Worst", and "The Safest and Longest-Lasting".

Weiss, MJ *Washingtonian* Vol. 17 No. 9, HS-033 226, June 1982, pp 179-185, Phots.

Acknowledgment: National Highway Traffic Safety Administration
Order From: Washington Magazine Incorporated, 1828 L Street NW, Suite 200, Washington, D.C., 20036

367933

MOTOR VEHICLE COST RESPONSIBILITY STUDY 1980. TECHNICAL APPENDUM

This Technical Appendum explains and develops more fully some of the procedures, concepts, and issues presented in the Final Report. It also presents a list of recommendations which will provide assistance and guidance to the next Cost Responsibility Study Team. There are five chapters and five appendices, as follows: the history of cost responsibility in Oregon; 1980 cost responsibility study; responses to criticisms of the 1980 study; recommendations for the next cost responsibility study; a proposal for an axle weight-distance road user charge; comments on the 1980 cost responsibility study final report; special studies; computer program; errata; and primary legislation which resulted from the findings and recommendations of the 1980 study.

Oregon Department of Transportation HS-033 228, Nov. 1981, v.p., Figs., Tabs., Apps.

This Report was prepared for the Sixty-First Legislative Assembly of The State of Oregon.

Acknowledgment: National Highway Traffic Safety Administration
Order From: Oregon Department of Transportation, Highway Planning Section, Economic Services Unit, Salem, Oregon, 97310

367934

TEENAGE DRIVERS AND ALCOHOL USE

This Research Note briefly states the extent of the problem of motor vehicle fatalities attributed to teenage drivers, then presents four key facts which summarize existing knowledge concerning teenaged drivers and alcohol use. Since Research Notes have the goal of making information publicly available on a timely basis, for more extensive information on the subject presented the reader is provided with a list of references in support of the conclusions presented.

Williams, AF
Insurance Institute for Highway Safety Reseach Note 101, HS-033 229, May 1982, 3p, 18 Ref.

Acknowledgment: National Highway Traffic Safety Administration
Order From: Insurance Institute for Highway Safety, Watergate 600, Washington, D.C., 20037

367935

INDONESIA'S PELITA, ROAD MAINTENANCE, AND TRAFFIC SAFETY PROGRAMS

After a review of the geography and population of Indonesia, the article focuses on the National Development Plans, called Pelitas. The first Pelita, established in 1969, included US$ 750 million for road improvements for the years 1969-73. The second Pelita, extending through 1978 had a budget of nearly U.S. $ 1500 million, and the third Pelita, which will end in 1983, has a budget of U.S.$ 2700 million for road works and maintenance. Indonesia's roads are administered and maintained at four levels of government-national, provincial, district and village. The Pelita covers the first three of these networks. Road maintenance on district and village roads will continue to rely on labor-intensive methods when possible but roads within the national and provincial system will have greater amounts of mechanical equipment. Highway safety within Indonesia is best described as an idea which has yet to be established within the behavior pattern and philosophy of the road users and the public, but the outlook for both road development and safety improvement is positive within the short term and the extended future.

World Highways Vol. 23 No. 4, HS-033 230, May 1982, 3p, Phots.

Acknowledgment: National Highway Traffic Safety Administration
Order From: International Road Federation, 1023 Washington Building, Washington, D.C., 20005

367936

N ANALYSIS OF THE TRAFFIC SAFETY PHENOMENON

Stating that traffic unsafety is a combination of the critical coincidence of circumstances in the traffic of incidents (near-accidents) and accidents with unwanted (permanent) consequences, such as fatalities, injured and disabled persons and material damage, this publication presents an analysis of the traffic safety phenomenon. The discussion is presented within the following general topics: the model of the accident process; relationship between research and policy making concerning road traffic systems; control of the transport and traffic systems decision and learning strategies of man; measures against unsafety; example of a set of output indicators; and coherent traffic safety policy and coherent traffic safety policy.

Asmussen, E Kranenburg, A

Institute for Road Safety Research Publication 1982-1E, HS-033 231, 1982, pp 1-26, 2 Fig., Refs.

Acknowledgment: National Highway Traffic Safety Administration

Order From: Institute for Road Safety Research, P.O. Box 71, Deernsstraat 1, 2119 Voorburg, Netherlands

367937

TRAFFIC FLOW MODELS. STATE OF THE ART REPORT

This booklet contains the complete translated text of Part I and Part X of an extensive state-of-the-art report on traffic flow models by H. Botma. It also contains a brief summary of each Part of the original report, and an index of all the literature referred to in the report, listed according to subject matter. The principle of classification followed in the report is the amount of detail in the various descriptions of a traffic flow, in which three levels are distinguished: macroscopic, mesoscopic and microscopic.

Botma, H

Institute for Road Safety Research Publication 1981-2E, HS-033 232, 1981, 62p, 2 Fig. Refs.

Acknowledgment: National Highway Traffic Safety Administration

Order From: Institute for Road Safety Research, P.O. Box 71, Deernsstraat 1, 2119 Voorburg, Netherlands

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Numbers under each entry are TRIS accession numbers in the order of their occurrence in this publication. For example, accession numbers 362050 and 362051 appear under ***Consumers' Research***, the journal that contains the full-text articles.

A

AAAM QUARTERLY/JOURNAL American Association for Automotive Medicine; P.O. Box 222; Morton Grove, Illinois, 60053
366785, 366809

ABSTRACTS & REVIEWS IN ALCOHOL & DRIVING California University, Los Angeles; Alcohol Research Center, 760 Westwood Plaza; Los Angeles, California, 90024
361584

ACCIDENT ANALYSIS AND PREVENTION Pergamon Press Limited; Headington Hill Hall; Oxford OX3 0BW, England
361667, 361668, 361669, 361670, 361671, 361689, 361690, 361691, 361692, 361693, 361694, 361695

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NATIONAL INSTITUTE FOR OCCUPATIONAL SAFETY & HLTH Center for Disease Control; Rockville, Maryland, 20857
366505, 366506

NATIONAL INSTITUTE OF HANDICAPPED RESEARCH Department of Education; Washington, D.C.
366811

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367620, 366806

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NATIONAL SAFETY NEWS National Safety Council; 444 North Michigan Avenue; Chicago, Illinois, 60611
367628, 367629

NATIONAL TRANSPORTATION SAFETY BOARD Bureau of Accident Investigation; Washington, D.C., 20594
366774

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346840, 347138

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348583, 362017

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361634, 367115

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362066, 367089

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366996

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362076, 366503, 367911

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367928

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366779

O

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364847, 367002, 367910

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318499, 318935, 364985

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341628

OREGON DEPARTMENT OF TRANSPORTATION 140 Transportation Building, Policy and Planning; Salem, Oregon, 97310
367930, 367933

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361576, 361577

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366972, 366973, 367670

P

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366790, 366791, 366794, 366795

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366530, 366531, 366775, 366776, 366788, 367112, 367621

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366519, 367282, 367631, 367931

PRISM CORPORATION 4545 42nd Street, N.W.; Washington, D.C., 20016
326256, 326257

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366813

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361534

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349952

R

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362399

S

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367651, 367652, 367653

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367261

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367262

SOUTHWEST RESEARCH INSTITUTE 6220 Culebra Road, P.O. Drawer 28510; San Antonio, Texas, 78284
326069, 326070, 367295, 367314

STANFORD UNIVERSITY Guidance and Control Laboratory; Stanford, California, 94305
364874

STATUS REPORT Insurance Institute for Highway Safety; Watergate 600; Washington, D.C., 20037
362413

STOCKTON POLICE DEPARTMENT Stockton, California
367296, 367297

SWEDISH MOTOR VEHICLE INSPECTION COMPANY Box 508; S-162 15 Vallingby, Sweden
362064

SYSTEMS TECHNOLOGY, INCORPORATED 13766 South Hawthorne Boulevard; Hawthorne, California, 90250
326261, 367929

T

TEXAS STATE DEPARTMENT OF HIGHWAYS & PUBLIC TRANSP Transportation Planning Division; Austin, Texas, 78763
347822

TEXAS STATE DEPARTMENT OF HIGHWAYS & PUBLIC TRANSP Transportation Planning Division, P.O. Box 5051; Austin, Texas, 78763
346185

TEXAS TRANSPORTATION INSTITUTE Texas A&M University; College Station, Texas, 77843
345375, 346185, 347822

TEXAS TRANSPORTATION INSTITUTE Traffic Accident Research and Evaluation Program; College Station, Texas, 77843
362061

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366508

TILDEN PRESS 1737 DeSales Street, NW; Washington, D.C., 20036
362365

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367927

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348957, 349138, 361683, 361684, 362272

TRAFFIC INJURY RESEARCH FOUNDATION OF CANADA 171 Nepean Street, 6th Floor; Ottawa, Ontario K2P 0B4, Canada
367663

TRAFFIC RESEARCH CIRCULAR Ministry of Transport, New Zealand; Private Bag, Traffic Research Section; Wellington, New Zealand
348914

TRAFFIC SAFETY National Safety Council; 444 North Michigan Avenue; Chicago, Illinois, 60611
366808, 367096, 367097, 367098, 367634, 367639

TRAFFIC SAFETY NEWSLETTER National Highway Traffic Safety Administration; 400 7th Street, SW; Washington, D.C., 20590
362370, 362371, 366819

TRAFIKSAEKERHTSVERKET Borlaenge, Sweden
361142

TRAILER LIFE Trailer Life Publishing Company Incorporated; 23945 Craftsman Road; Calabasas, California, 92132
362057, 366781, 366826, 367113, 367114, 367623, 367633, 367922, 367923

TRANSPORT AND ROAD RESEARCH LABORATORY Old Wokingham Road; Crowthorne RG11 6AU, Berkshire, England
345815, 345894, 345898, 348578, 348580, 348932, 348939, 348941, 349535, 349540, 349999, 361002, 367675

TRANSPORT CANADA RESEARCH AND DEVELOPMENT CENTRE Road and Motor Vehicle Safety Branch; Ottawa, Ontario K1A 0N5, Canada
362385

TRANSPORT REVIEW Taylor and Francis Limited; 4 John Street; London WC1N 2ET, England
361666

TRANSPORTATION QUARTERLY Eno Foundation for Transportation, Incorporated; P.O. Box 55, Saugatuck Station; Westport, Connecticut, 06880
362412, 367656

TRANSPORTATION RESEARCH BOARD SPECIAL REPORT Transportation Research Board; 2101 Constitution Avenue, NW; Washington, D.C., 20418
348653

TRANSPORTATION RESEARCH CIRCULAR Transportation Research Board; 2101 Constitution Avenue, NW; Washington, D.C., 20418
345110, 361331

TRANSPORTATION RESEARCH NEWS Transportation Research Board; 2101 Constitution Avenue, NW; Washington, D.C., 20418
345286

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349081, 349811, 362058

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362059, 362060

TRANSPORTATION SCIENCE Operations Research Society of America; 428 East Preston Street; Baltimore, Maryland, 21202
361523, 366509, 366770, 366978

TRANSPORTATION SYSTEMS CENTER Research and Special Programs Administration; Cambridge, Massachusetts, 02142
362366, 362404, 362405, 362406, 362407

TRANSPORTATION SYSTEMS CENTER 55 Broadway; Cambridge, Massachusetts, 02142
326058, 326318, 326429, 329138, 337124, 337125, 337126, 337182, 347818, 364874, 367910

U

UNFALL UND SICHERHEITSFORSCHUNG STRASSENVERKEHR Federal Institute of Road Research, West Germany; Bruhlerstrasse 1, Postfach 510530; D-5000 Cologne 51, West Germany
367637

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366976

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362380

V

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367259, 367260

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349949

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362131, 362135, 362136, 362138, 362139, 362141, 367648

VIRGINIA DEPARTMENT OF HIGHWAYS AND TRANSPORTATION Department of Transportation Safety, 1221 East Board St; Richmond, Virginia, 23219
366823

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367094

VIRGINIA DEPT OF HWYS AND TRANSPORTATION BULLETIN Virginia Department of Highways and Transportation; 1221 East Broad Street; Richmond, Virginia, 23219
362070

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349256, 367000, 367671

VOLKSWAGENWERK AG Research Division; Wolfsburg, West Germany
337124, 337125, 337126, 337182

W

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366995

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367099, 367292

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326457, 326458, 326459

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WORLD HIGHWAYS International Road Federation; 1023 Washington Building; Washington, D.C., 20005
367935

WYOMING STATE HIGHWAY DEPARTMENT Highway Safety Branch, P.O. Box 1708; Cheyenne, Wyoming, 82001
367664

AUTHOR INDEX

The Author Index lists personal authors of papers included in this publication. Under each name are posted the TRIS accession numbers of those abstracts for which the person has been named as author or coauthor.

A

ABBOTT, FP
349949
ABNEY, T
367312
ABRAM, P
326416
ABRAMS, R
366510
AGENT, KR
362068
ALBRECHT, GL
366997
ALDMAN, B
366518, 366809, 367700, 367701, 367711, 367722
ALEM, NM
366505, 366506
ALLEN, RW
326261, 366537, 367929
ANDARY, JJ
347116
ANDERSEN, DA
366820
ANDERSEN, PK
366784
ANDERSON, TE
319852
ANDON, J
367261
ANDREWS, WB
347818
ANSELM, D
367091
APPEL, IH
367703
ARAT, M
349986
ARENDT, RH
318980
ARMSTRONG, J
366782
ARTHURSON, RM
361623
ASMUSSEN, E
367936
ASTRAND, I
367700
ATKINS, AS
362145, 367647
ATSUMI, T
361057
ATTWOOD, DA
366778, 366988

B

BAER, I
362365
BAHNSEN, U
361674
BALASUBRAMANIAN, V
367626
BALLDIN, U
367700
BARDALES, MC
367260
BARKER, TD
367678
BASKETT, PJF
361702
BASSIM, A
367684
BATES, HJ
361002
BATHURST, JR
326032
BAUM, AS
367269
BAUMAN, R
366810
BEAUBIEN, RF
367658
BECK, KH
367917
BECKER, JM
362383
BEDARD, P
367286
BEDDOW, B
367263
BEHARRELL, J
326038
BEIER, G
367705
BELL, M
326318, 326429
BELOHOUBEK, EF
367636
BENJAMIN, TEA
366809
BENNER, L, JR
366565
BERGER, S
367263
BERGMAN, H
366813
BERKLINE, RR
366801
BERKOWITZ, A
347917, 362371
BERTHOMMIER, M
367719
BERTRAM, B
367649
BETTISON, M
361684
BETTS, T
367280
BEXON, R
367715, 367716
BHISE, VD
362415
BIERLEIN, LW
367002
BILLAULT, P
367719
BISHEL, RA
366999
BLAAUW, GJ
367920
BLAAW, GJ
367921, 367926
BLACKMORE, H
361624
BLOKPOEL, A
361140
BLOMBERG, RD
319852, 367275
BLUME, SB
349259
BOCK, IM
367648
BOEHLY, WA
367311
BONNEY, MC
362402
BORCHETS, RH
366974
BOTMA, H
367937
BOTTOMS, DJ
366992
BOUIS, D
366987
BOURRET, P
367698, 367707, 367719
BOWES, M
366805
BOWMAN, JD
346185
BOWSER, JS
366778
BOX, PC
362067
BOYD, JH
326263
BRACKEMEYER, U
366793
BRAININ, PA
326021
BRANDT, D
367635
BRANSTON, D
362060
BRAZIL, P
361624
BRENNER, FC
366971
BRINKMAN, CP
349949
BRITTAIN, DB
366516
BROMBART, M
367690

BROWN, C
367303
BROWN, DB
318962
BROWNLEE, M
367312
BRUHNING, E
361695
BRYANT, AH
366526
BUNKETORP, O
367710, 367711
BURGER, WJ
367259, 367260
BURGESS, WT
366811
BURKE, C
367261
BURKE, CE
367262
BUTLER, BP
366811

C

CACCIOLA, I
366518, 367722
CALLOW, GD
341118
CAMERON, MH
361633, 367646
CAMPBELL, KL
349257, 367650
CAMPBELL, TD
362074
CANTWELL, C
328908
CAPLAN, JD
362412
CARNEY, JF, III
349811
CARR, WP
367635
CARRARO, B
367639
CARRICO, CJ
367641
CARRIER, H
362419, 366816, 367655
CARROLL, HO
318939, 326251, 326252
CARSTEN, O
362077
CASE, DJ
362272
CASE, K
362402
CASHMAN, P
367626
CAVALLERO, C
367698, 367707, 367719
CEDER, A
361691, 361692
CERULLO, B
367288, 367924
CESARI, D
367698, 367706, 367719
CHAMOUARD, F
367714
CHANG, CJ
361671
CHAPON, A
367712
CHARBONNET, CR
326069, 326070, 367314
CHI, GYH
366503
CHINN, BP
361002
CLEVEN, AM
318500
CLYNE, F
326416
COBB, J
361272
COLE, WM
347818
COMPAGNA, M
362366
COMPTON, CP
366806
CONLEY, CG
349949
CONNELLEY, TJ
361623
COOKSEY, RW
366986
COOPER, DF
349138
COOPER, GJ
367715, 367716
COPASS, MK
367641
CORBEN, CW
361634, 367115
COUNCIL, FM
367911
COWLEY, JE
367645
CROMACK, JR
367295
CROPPER, R
318501
CROSS, A
318933
CROWLEY, KW
367907
CRUZIC, K
366769
CSERE, C
367285
CURRAN, KN
326256, 326257
CYSTER, R
348941

D

DAIKI, K
362375
DALBY, E
348957
DALMAS, J
367719
DANIEL, RB
367911
DANNER, M
367091
DAOU, N
367719
DAVIES, P
361684
DAVIES, R
361702
DAVIES, VE
345894
DAVIS, S
326038
DAWKINS, MP
367283
DAWSON, NE
367913
DAY, AJ
366771
DE GIER, JJ
366813
DEBARTOLO, KB
367275
DECKER, JD
362462
DEDOYAN, A
367706
DELEYS, NJ
364993
DEVLUKIA, JN
356764
DIMARCO, RJ
366537, 367929
DINAN, BJ
366824
DINNING, TAR
361623
DONELSON, AC
318982, 318983, 318984, 318989, 326410, 326411
DONOHUE, RJ
362072
DORGHAM, MA
367287
DOUGLASS, RL
366806
DOWNING, A
349535
DRAHOS, RW
364987
DREUSSER, DF
367275
DUDEK, CL
345375
DURAL, H
367721
DUWALDT, FA
367300

E

EASLER, ME
367640
ECKEL, CE
318514
ELLINWOOD, EH
367640
EMSER, J
366514
ENDO, Y
361058
ENOMOTO, K
349987
ESTES, B
367623, 367922, 367923
ETELAMAKI, GR
366515
EVANS, L
361694, 366984

F

FAHERTY, JD
367914
FALK, J
366790
FAMBRO, DB
347822
FARISSE, J
367719
FAVERJON, G
367695
FAYON, A
367714
FAZIO, CP
366986
FELL, JC
319852, 367274
FIELDING, GJ
367656
FIFE, D
366529
FILOU, C
367721
FISHER, A
367282
FISHER, PG, JR
318940
FLEMING, RR
367634
FLEMMING, RR
366819
FLEMONS, DM
345286
FLETCHER, JA
349952
FLORA, JD
347116, 348376
FLOWERS, RJ
362061
FLYNN, L
326060, 326433
FORBES, LM
362415
FORMAN, NV
318930
FOSCHIO, LG
349259
FRANKLIN, AL
347818
FRECKER, RC
366778
FREDETTE, HO
367277, 367278
FRIEDEL, B
367708
FRIEDMAN, K
318464, 318465, 318506
FRITH, WJ
366996
FUHRMANN, T
367090
FUJIKI, Y
362427
FUKUDA, M
349989
FURUHAMA, S
349987
FURUKAWA, O
349986

G

GAGNE, G
326318, 326429

GARRETSON, M
349261
GARRETT, JW
367269
GARRETT, MS
362074
GARROT, WR
364989
GARRY, KP
367680
GASTAUD, R
367698
GAUTHIER, D
365135
GENIN, J
367682
GERAGHTY, J
367113
GEURTS, CA
367096
GILLIS, J
362365
GIPPS, P
362060
GLASER, I
364874
GLICKMAN, AP
367111
GLOYNS, PF
367693
GODTHELP, J
367919

GOLD, MW
362065
GOLDBERG, L
362395, 362396, 362397
GOLDBLATT, R
367264
GOODMAN, DM
318499
GOODNIGHT, TW
364990
GORDON, DA
347826
GORDON, F
349081
GOT, C
367695, 367714
GRAHAM, JL
362017
GRAMBOW, L
366794
GREENBAUM, R
361702
GREGORY, DR
362066
GREGORY, FMH
367674
GREINER, A
366791, 366792
GREYSON, M
318939, 326251, 326252, 326260, 326264
GRIFFIN, LI, III
362076
GRIMM, AC
318938, 367277, 367278
GROMER, C
367905
GUENTHER, D
364989
GUILLON, C
367714
GUNTUR, R
361672
GUSTAFSSON, G
367709
GUSTAFSSON, H
366518, 367700, 367701, 367722
GUTMANN, G
366514

H

HAAS, GC
367663
HACKNEY, J
367312
HADDON, W, JR
366980
HAGUES, SB
367699
HAIGHT, FA
366567
HAKKERT, AS
361693
HAKOZAKI, T
349990
HALL, WL
367911
HALLER, R
366987
HANEY, J
349257
HANNON, R
367296, 367297
HANSTEAD, JK
367693
HARDING, PRJ
366771
HARDWOOD, DW
362017
HARDY, RN
366762
HARGROVES, BT
367671
HARGROVES, JM
367671
HARGROVES, RA
361272
HARPER, FD
367283
HARRIS, CM
366993
HARRIS, WJ
362403
HARRISON, HR
367684
HARRISON, JF
318930
HARRISON, PC, JR
367907
HARRISON, WL
349930
HARROP, SN
367638
HARVEY, MR
318514
HASLEGRAVE, CM
366762, 366763
HASSLER, CR
364990
HATCH, WE
326432
HATCHER, DR
345375
HAUSE, J
367296, 367297
HAUSER, R
367654
HAWK, D
366779
HAWKINS, RW
362462
HAYES, HRM
367693
HEDGES, R
341118
HEGMON, RR
361534
HEINTZ, F
366987
HELLIAR-SYMONS, RD
345815
HENDERSON, NH
326256, 326257
HENDRICKS, DL
364983
HENDTLASS, J
367648
HENRY, C
367695, 367704
HERBERT, DC
361634, 367115
HERRIDGE, JT
364990
HERZOG, P
366773
HIGGINS, PC
366997
HIGUCHI, M
362422
HILDENBRAND, BA
362412
HILL, R
366519
HIRAOKA, T
362426
HIROYASU, H
349986
HITOMI, N
362422
HOADLEY, MR
366802
HOBBS, CA
345898
HOBEIKA, AG
349081
HOCHBERG, Y
366569
HOLMGREN, E
367723
HOLTZMAN-PARCELLS, H
366511
HOMEL, R
362135
HOPKINS, HG
366974
HORI, O
362053
HOSEY, R
364874
HOSKIN, AF
367629
HOUK, R
364989
HOWELL, LJ
366783
HUBER, KR
318938, 367277, 367278
HUDDLESTON
346185
HUELKE, DF
347116, 367100, 367101, 367102
HUETTICH, RC
366517
HULL, M
348914, 367666
HUME, RD
362384, 366569
HUMMEL, T
367697
HUNTER, JR
366824
HUREAU, J
367714
HUTCHINSON, JW
367295
HUTCHINSON, TP
361523, 366770, 366978
HUTTICH, RC
367672
HVELKE, DF
361669

I

ICHTER, KD
362409
IIDA, S
349986
INABA, A
362423
IRVING, A
345815
ISHIDA, Y
362374
ISHIHARA, T
349988

J

JACOBS, GD
361666
JACOBS, JA
367095
JANICKI, E
362378
JEFFERY, DJ
348580
JICK, H
366824
JOHANSSON, B
367701
JOHNSON, JE
326069, 326070, 367314
JOHNSON, N
326038
JOHNSON, WA
366537, 367929
JOHNSTON, IR
362136
JONAH, BA
367913
JONASSON, H
367701
JONDROW, J
366805
JONES, RK
318989, 364988
JONSON, R
367711
JORDAN, M
367667
JORDON, PW
361625
JOSCELYN, KB
318939, 318982, 318983, 318984, 318989, 326251, 326252, 326259, 326260, 326264, 326410, 326411, 364988, 366828
JOSEPH, A
362421
JOYCE, WT
318930
JUHL, M
367694
JULIAN, EJ
366768

K

KAAG-VANRP, AG
367142
KAHANE, CJ
362386
KALBE, P
367702, 367703
KANDEL, DB
367925
KARLSSON, L
367709
KATOH, H
349989
KEARNEY, EF
362388, 362390
KELLER, R
365157
KEMPIN, F
366794
KERR, SK
326030
KING, AI
326457, 326458, 326459
KLEIN, RH
326261
KLEIN, S
367633
KLINGBERG, CL
366785, 367654
KOKESCH, P
367098
KOLM, JE
361624
KORTTILA, K
367616
KOURTIDES, DA
367644
KOUSHKI, PA
366989
KRANENBURG, A
367936
KRIEGER, KW
326457, 326458, 326459
KUME, M
362375
KURIHARA, K
361673

L

LAANANEN, DH
365135
LAI, PW
361523, 366978
LAKER, IB
349999
LANDAUER, AA
366814
LANGWIEDER, K
367697
LEAF, WA
367275
LEE, C
362049

LEE, MT
347695
LEMKE, M
361690
LENZ, KH
367708
LEVIS, J
362402
LEVY, R
366805
LIEBERMAN, EB
367264
LIN, J
364989
LINDGREN, S
367723
LINDSTROM, L
367723
LINES, CJ
348939
LINNOILA, M
367640
LITT, IF
366990
LITTLE, JW
362417
LIU, W
367276
LIVNEH, M
361691
LOCH, CH
367688
LOMBARDO, LV
367311
LONSDALE, CJ
367915
LUDTKE, NF
318976, 326058
LUNA, GK
367641
LUNA, RE
361098
LUND, B
367290
LUNDT, PV
366501
LYLES, RW
367119
LYNN, C
367000

M

MAAHS, G
366815
MACADAM, C
367106
MACKAY, GM
367699, 367713
MACRINA, DM
366802
MADIGAN, T
366826
MADSEN, S
366824
MAHALEL, D
361693
MAKINO, S
362056
MALINS, AF
361702
MALTHA, J
367717, 367718
MANN, S
367626
MARKS, LE
361624
MARKS, ME
364988
MARSDEN, AM
361272
MARTIN, M
364989
MASON, RL
367295
MATER, RK
362057, 366781
MATSUMOTO, H
361058
MATSUMOTO, K
349990, 362375

MATTSON, S
318933
MAXWELL, DM
362411
MAYHAN, RJ
366999
MAYHEW, DR
367663
MAYNARD, RL
367715, 367716
MAYZE, TD
362063
MCBURNEY, LJ
366778
MCCANN, MK
362379, 367630
MCDOWELL, ED
362415
MCELROY, J
366520, 366786, 367107
MCGUIGAN, DRD
361683
MCKENZIE, JA
362138
MCKIBBEN, W
366529
MCLEAN, AJ
361623, 367691
MCLEAN, RF
318967
MCNAIR, JW
318989, 326264, 364988
MCQUADE, W
367643
MELDRUM, JF
362415
MELLMAN, RE
326263
MENDELSOHN, RA
367100
MERCALDO, S
367631, 367931
MERRITT, JO
326030
MESSENGER, GS
366504
MEYER, JR
365157
MICHAEL, HL
349952
MILLAR-CRAIG, MW
367626
MILLER, B
367263
MILLER, JC
326030, 326261
MILLER, PM
318980, 367300
MILLER, WR
367114
MITCHELL, B
366510
MIYAJIMA, M
362423
MOLTER, DW
367640
MOORE, RL
367675
MOORING, BW
367682
MORISAWA, M
361673
MORRIS, RL
366974
MUKAI, R
362055
MULDER, JAG
361140
MULHOLLAND, MU
367259, 367260
MULLINS, PJ
366787
MURANAKA, S
366772
MYERS, TT
366537

N

NAGY, B
366789
NAITO, T
362056
NAKAJIMA, Y
349985, 366772
NAKAKUBO, T
361057
NASH, CE
367657
NEFSKE, DJ
366783
NELEMANS, FA
366813
NELL, JJ
362377
NEMETH, ZA
367906
NEWLAND, L
362368
NICHOLS, JL
367268
NIELSEN, HV
367692
NISHIGUCHI, T
349987
NISHIKAWA, K
362053
NISHIKURA, S
362052
NISHIO, K
362054
NOJIRI, S
362425
NORDENTOFT, EL
367692
NORO, S
362056
NUSBAUMER, MR
366798
NYGREN, A
366518, 367700, 367701, 367722

O

O'DAY, J
347116, 361669, 361670, 367100,
367102, 367291, 367649, 367650
O'HANLON, RH
341419
O'ROURKE, PJ
367284
OETTING, H
337124, 337125, 337126, 337182
OHATA, A
362374
OHMAE, H
361673
OKAMI, Y
361673
OLDFIELD, JA
367677
OLSON, PL
361668, 362072, 366502, 366811
OMORI, H
362375
ORESKOVICH, MR
367641
ORR, BT
367911
ORSONI, P
367698, 367707
OSGOOD, DJ
366983
OTTE, D
367702, 367703
OVEREND, RB
367097

P

PADGAONKAR, AJ
326457, 326458, 326459
PALEY, MG
362071
PARADA, LO
367269
PARKER, JA
367644
PARTYAKA, S
367276
PATEL, A
367695, 367714
PAULSON, JA
362075, 366998
PEARCE, BP
367715, 367716
PECK, RC
349261
PEDDER, JB
367699
PEGG, SP
362063
PERCHONOK, K
367907
PERL, MB
367914
PETERSON, FL
366802
PETTIS, LC
366806
PEYTON, WF
318487
PHEASANT, ST
366993
PHILLIPS, BM
318499, 318935, 364985
PITSIAVA-LATINOPOULOU, M
361689
PITTS, DG
366827
PORT, JM
362402
POST, DV
362072

POTOCKI, FP
349540
POULET, B
367690
POWELL, JD
364874
POZZI, M
318496, 318515, 318916, 318944
PRASHKER, JN
361693
PRITZ, HB
364990
PROCTOR, S
367693
PUGLIESE, SM
367300

Q

QUIMBY, AR
348578
QUINCY, R
367696, 367698

R

RAFTERY, EB
367626
RAMET, M
367696, 367698, 367706, 367719
RANDALL, K
364874
RAO, RK
361098
RATTENBURY, SJ
367693
RAU, RG
347818
REASER, JM
3651[illegible]7
REDMOND, D
318464, 318465, 318506
REEDER, RH
367928
REGAN, DJ
366823
RENICK, S
367261, 367262
RETTIG, H
366792
RHOADS, RE
347818
RICCI, LL
326250, 326349
RICHARDS, SH
346185
RICHARDSON, BC
366828
RICHTER, ED
367624
RIEDIGER, G
366514
RIEMERSMA, JBJ
367916
RILEY, BS
345894, 361002
RIMM, DC
367914
RIVLIN, AZ
367693
ROBBINS, DH
362383
ROBERTS, BJ
367699
ROBERTS, DC
366828
ROBERTSON, LS
366800
ROBINSON, A
367289
ROCKWELL, TH
362415
RODDIN, MF
348583
ROE, PG
347695
ROGNESS, RO
347822
ROMANUS, B
367710, 367711
ROMBERG, RA
362384
ROMER, CJ
367689
ROOS, B
367711
ROPER, WL
362376
ROSNER, B
366529
ROSS, D
367263
ROSS, DC
366797
ROUPHAIL, NM
367906
ROWBOTHAM, EM
367679
RUSCHMANN, PA
318939, 318989, 326251, 326252, 326259, 326260, 326264
RUSSELL, IF
362138
RUSSELL, RM
362074
RYAN, MP
367648
RYDER, MO, JR
367300

S

SABEY, BE
367675
SACRESTE, J
367704
SAFFRON, DG
367927
SAGERER, F
367697
SALTER, DR
361684
SALZBERG, PM
366785, 367654
SAMMON, RP
361624
SAMPLINER, RE
362074
SANDERS, MS
362414
SANDLER, J
366530
SANKAR, S
361672
SANKAR, TS
361672
SANO, S
367681
SATO, TB
361673
SAXONHOUSE, GR
329138
SAYER, IA
349535
SCANLON, M
367090
SCHERZ, RG
366803
SCHLAG, B
366514
SCHMITZ, B
318464, 318465, 318506
SCHROER, BJ
318487
SCHULER, R
366815
SCHULLER, E
367705
SCHULTZ, M
366531, 366533, 366776, 366788, 367112, 367621
SCOTT, D
362373
SCOTT, PL
366988
SCOTT, PP
361272
SCOTT, RA
366510
SEBASTIAN, AA
345286
SEDGLEY, IP
367675
SEERUP, KK
367694
SEGEL, L
318502
SEGEL, LD
366828
SEGUIN, EL
36[illegible]07
SEIFFERT, U
361676
SEJOURNE, P
367707
SELECKI, BR
361623
SENDELBAUGH, JW
366808
SERIAT-GAUTIER, B
367719
SHARKEY, TJ
367259, 367260
SHEFFI, Y
366516
SHELTON, EM
367660
SHORT, MS
361671
SHUEY, KB
362139
SIEGEL, HM
367262
SIEGENER, W
366514
SIMANAITIS, D
362400
SIMPSON, HM
367663
SINHA, KC
349952
SININGER, RA
367914
SIVAK, M
361668, 362072, 366502, 366811
SMART, RG
367627
SMITH, CA
367713
SMITH, GA
367913
SMITH, JG
367092
SMITH, K
361670
SMITH, MJ
326379
SMITH, P
366500, 366501
SMITH, RG
366801
SMITH, RL
367259, 367260
SNYDER, J
367103
SPITZ, S
367632
SPORRONG, A
367700
SQUIRES, ML
362384, 366569
STACEY, BG
367915
STAINER, MC
367715, 367716
STALHAMMAR, D
367723
STALNAKER, RL
367717
STANDLEY, J
366973
STATES, JD
361669
STEINERMAN, PR
366990
STENQUIST, P
366532, 367904
STERGACHIS, A
366824
STOCKTON, WR
345375
STOICA, TL
367281
STOKE, CB
349256
STOLLERY, JL
367680
STURGIS, SP
366983
STURTZ, G
367720
SUDIT, M
367925
SUGIHARA, K
349985, 366772
SUGINO, K
362054
SUMMALA, H
362416, 366985
SUREN, EG
367702, 367703
SUZUKI, T
362054
SVENSON, O
362073
SWANSON, K
367635
SWIERCINSKY, TH
367295

T

TACHAKRA, SS
362398
TAHON, P
367690
TAKAGI, Y
349985, 366772
TAKAHASHI, K
362426
TAKASE, K
362056
TAKEMATSU, K
362052
TAKEZAWA, N
362424
TANAKA, H
349988
TARATO, M
349990
TARRANTS, WE
362370
TARRIERE, C
367695, 367704, 367714
TAYLOR, DEM
367716

TAYLOR, TJ
318976
TERHUNE, KW
367274
THATCHER, C
326023, 326024, 326025
THOMAS, C
367695, 367704
THORNGREN, L
367711
TIERNEY, E
366782
TOM, J
349949
TORRES, J
362399
TORRINGTON, K
367666
TRAN, TK
349081
TRAUCHESSEC, R
367712
TRIBBLE, RE
367296, 367297
TRINCA, GW
362141
TRINKOFF, AM
367911
TSCHERNE, H
367703
TSOHOS, G
361689
TURNER, DS
347822
TYNDALL, LH
365132, 365135

U

UNIACKE, GC
361624
UNY, C
367696
UPPALURI, SV
362384
URANO, S
362426
USUI, H
362052

V

VADEBONCOEUR, JR
365157
VALLEE, H
367704
VAN NORREN, D
366804
VARTERASIAN, JH
366822
VELDKAMP, MB
326410, 326411
VELING, IH
361667
VERGARA, RD
364990
VERMA, MK
349031
VERRIEST, JP
367712
VIERGUTZ, OJ
318933, 318967, 326416
VINCENT, EN
361629
VINGILIS, E
367627
VOLKER, R
361695
VON BUSECK, CR
366984

W

WADDELL, RL
367292
WAGENAAR, AC
366806, 366991
WAKELEY, H
318933, 318967
WALFISCH, G
367714
WALLER, AE
367911
WALLER, JA
367089
WALLER, PA
362076
WALTER, R
326318, 326429
WALZER, P
361676
WARD, H
348957
WARE, AS
326379
WARLICK, MV
366974
WARREN, RA
367663
WASIELEWSKI, P
361694, 366509, 366984
WATTS, GR
348578
WEBER, K
318502
WEBER, KB
367101
WEISS, MJ
367932
WEISSBRODT, G
366514
WELLEMAN, AG
367143
WELLS, P
348932
WENNELL, J
349138
WERSALL, J
366518, 367701, 367722
WEST, J
366765
WHITE, WA
367093
WHITLEY, MD
367914
WIGGLESWORTH, EC
361623
WILDING, JF
361624
WILKINS, HA
345894
WILLENBERG, C
366514
WILLIAMS, AF
366807, 367934
WILLIAMS, AR
345894
WILLIAMS, CL
349256
WILLIAMS, RD
366778
WILMOT, EL
361098
WILSON, RA
365157
WILSON, RY
367638
WINZER, T
362059
WISMANS, J
367717, 367718
WITCONIS, L
367670
WOELFL, GA
361671
WOLF, B
367650
WOLF, JA, JR
366783
WOLFE, AC
367291
WOOD, CM
367314
WRIGLEY, A
366995

Y

YAGI, T
361675
YAMAGUCHI, J
362373
YAMASHITA, R
361058
YANAI, T
362422
YATES, T
366775
YEE, R
318955
YING, S-J
367683
YOKOTSUKA, M
362425

Z

ZACHEM, H
362368
ZEIDMAN, K
367259, 367260
ZELINKA, FF
366795
ZIDER, SJ
362065
ZUB, RW
362404, 362405, 362406, 362407
ZUSMAN, ME
366798
ZWAHLEN, H
366982

RETRIEVAL TERM INDEX

The Retrieval Term Index contains terms that have been selected from the title and abstract of each document record published in this issue. Posted under each term are the six-digit TRIS accession numbers for those document records that relate to the term. For example, ABDOMEN is a descriptor for record 366799 on page 53.

A

A-CARS
367905
ABBREVIATED INJURY SCALE
362069, 367641, 367690, 367691, 367692, 367694, 367695, 367696, 367697, 367698, 367699, 367702, 367703, 367704, 367705, 367706, 367708, 367710, 367711, 367713, 367720, 367723
ABDOMEN
366799
ABSTRACTS
361584
ACCELERATION
326261, 349138, 362059, 366510, 366519, 366767, 367281, 367712
ACCESS
361331
ACCESSIBILITY
367315, 367656
ACCIDENT AVOIDANCE
326032, 362416, 366985, 367264
ACCIDENT CAUSES
361140, 361534, 362136, 366521, 366567, 366774, 367096, 367665, 367915
ACCIDENT COSTS
347116, 348376, 362076, 362145, 367268, 367305, 367310, 367629, 367647
ACCIDENT EXPOSURE
362077, 366569
ACCIDENT INVESTIGATION
318487, 318500, 318962, 319852, 345898, 347138, 362069, 362386, 362394, 364983, 364989, 366517, 366565, 366774, 367102, 367635, 367665, 367696, 367702
ACCIDENT PREVENTION
318980, 341419, 348957, 349535, 361577, 362136, 366537, 366567, 366977, 367092, 367142, 367624, 367634, 367636, 367689, 367712
ACCIDENT PRONE DRIVERS
349261, 366977
ACCIDENT PRONE LOCATION
348957, 349256, 361683, 366537
ACCIDENT RATES
318487, 347818, 347822, 348578, 348914, 349257, 349952, 361272, 361583, 361629, 361666, 361671, 361683, 361691, 361692, 362017, 362077, 362135, 362385, 366521, 366977, 367096, 367259, 367275, 367281, 367629, 367675, 367702, 367912
ACCIDENT RECONSTRUCTION
362069, 364989, 367702, 367708
ACCIDENT RECORD SYSTEMS
349949, 366777, 367096, 367306, 367702
ACCIDENT REDUCTION
361666, 362076, 362382, 362387, 362411, 366515, 367270, 367296, 367297, 367298, 367299, 367654, 367676
ACCIDENT REPORTS
318962, 345286, 361625, 362390, 366774, 366777, 367671, 367699
ACCIDENT SEVERITY
318464, 318506, 318980, 326250, 326349, 361002, 361669, 361671, 362145, 366521, 366774, 367097, 367100, 367264, 367276, 367634, 367635, 367638, 367641, 367647
ACCIDENT TYPE
319852, 366521, 367639, 367673, 367703, 367912
ACCIDENT VICTIMS
362063, 366521, 366529, 366977, 367097, 367638, 367641, 367912
ACCIDENTS
361098, 362067, 362076, 362382, 362384, 362388, 362390, 362411, 362417, 366517, 366518, 366522, 366527, 366529, 367000, 367115, 367264, 367672, 367673, 367703, 367705, 367706, 367721, 367722
ACCURACY
361629, 366783, 366794, 366991, 367301, 367671
ACOUSTICS
366783
ACRYLENITRILE-BUTADIENE-STYROLE
367705
ACUITY
362074, 366804, 366827, 366983, 367280
ADAPTATION
362398, 366512
ADAPTIVE EQUIPMENT/DISABLED DRIVERS/
366976
ADJUDICATION
367265, 367266, 367267
ADJUSTMENTS
362056, 367922
ADMINISTRATION
362408
ADMINISTRATIVE ORGANIZATION
348932
ADMISSIBILITY
366791, 366792
ADOLESCENTS
366798, 366990, 366997, 367620
ADULTS
319852, 367291, 367666
ADVERTISING
366508, 367095
ADVERTISING CAMPAIGN
362139

Retrieval Term Index

AERIAL TRAFFIC SURVEILLANCE
367308
AERODYNAMIC CONFIGURATIONS
367107, 367643
AERODYNAMICS
361674, 362373, 367287, 367680, 367701
AESTHETICS
361674
AGE
361634, 361670, 362072, 362077, 366827, 367100, 367269, 367639, 367673, 367690, 367692, 367695, 367697, 367699, 367710
AGENCIES
362393
AGING
362409
AGRICULTURAL MACHINERY
367651
AIR BAGS
362141, 366516, 367097, 367102, 367305, 367311, 367624, 367657
AIR BRAKES
349257
AIR DISC BRAKES
366973
AIR POLLUTION
361098, 366782, 366820
AIR TRANSPORTATION
362366, 366522
AIRCRAFT
366529
ALCOHOLISM
362071, 362074, 362395, 362396, 362397, 366500, 366508, 367089, 367283, 367620, 367654, 367925
ALCOHOLS
362378
ALERTNESS
366988
ALGORITHMS
367636
ALLOYS
362426
ALTERNATING CURRENT
367633
ALTERNATIVES
366516, 367282, 367929
ALTERNATIVES ANALYSIS
367272
ALTERNATORS
366767
ALUMINUM
366787, 367118, 367261, 367262, 367287, 367630
ALUMINUM ALLOYS
362379
AMBER
362385
AMERICAN MOTORS CORPORATION
362401, 362429
AMPHETAMINES
367625
ANALYSIS OF VARIANCE
366784
ANATOMY
367719
ANESTHETICS
367716
ANGLE PARKING
362067
ANIMALS
367715, 367716
ANTHROPOMETRY
366762, 366979, 367661, 367714, 367717, 367718, 367720
ANTI-KNOCK
347818, 367660
ANTI-THEFT DEVICES
366530
ANTILOCK SYSTEM
366510
APTITUDE TESTS
361667
ARBITRATION
367111
ARM
367712
ARRIVAL TIME
366509
ARTERIAL STREETS /URBAN/
348957
ARTICULATED VEHICLES
367682
ASAP /ALCOHOL SAFETY ACTION PROGRAM/
362397, 367103
ASSEMBLIES
362062, 366780
ASSOCIATION MODELS
362061
ATTENTION VALUE
366985
ATTENUATION
367701
ATTITUDES /MENTAL/
318499, 318940, 326256, 326257, 348578, 361142, 362139, 364985, 366508, 366567, 366802, 367001, 367917
AUDIO VISUAL AIDS
348583
AUDITING
362367
AUTOMATED TRANSIT SYSTEM
367712
AUTOMATIC CONTROL
364985, 366999, 367636
AUTOMATIC DOOR CLOSING
367712
AUTOMATIC SAFETY EQUIPMENT
318499
AUTOMATIC TRANSMISSIONS
349988, 367287
AUTOMATIC VEHICLE MONITORING
318931
AUTOMATION
362056, 362424, 362462
AUTOMOBILE ASSEMBLY PLANT
366520
AUTOMOBILE BODIES
349989, 361674, 362384, 362424, 366995, 367088, 367093, 367099, 367104, 367118, 367643
AUTOMOBILE DEALERS
367099, 367674, 367910
AUTOMOBILE ENGINES
326318, 326429, 326432, 349987, 361057, 361675, 362056, 362379, 362412, 362429, 366826
AUTOMOBILE INDUSTRY
318499, 326263, 326416, 329138, 362369, 362375, 362403, 362410, 362412, 362424, 366520, 366768, 366786, 366980, 366995, 367099, 367289, 367292, 367307, 367310, 367619, 367630, 367643, 367667, 367677, 367679, 367910
AUTOMOBILE INSURANCE
362365, 362380
AUTOMOBILE MAKES
362051, 362064, 366980, 367643, 367909
AUTOMOBILE OWNERSHIP
364985
AUTOMOBILE TIRES
326069, 362365
AUTOMOBILES
318464, 318465, 318487, 318499, 318506, 326021, 326038, 326060, 326349, 337124, 337125, 337126, 337182, 348583, 349031, 349081, 349138, 361676, 361684, 362062, 362064, 362072, 362365, 362366, 362369, 362404, 362405, 362406, 362407, 362409, 364983, 366507, 366511, 366528, 366530, 366767, 366771, 366775, 366783, 366810, 366817, 366822, 366976, 366986, 366987, 366997, 367001, 367088, 367093, 367107, 367109, 367111, 367112, 367117, 367261, 367262, 367263, 367285, 367288, 367289, 367290, 367309, 367312, 367619, 367621, 367630, 367631, 367637, 367643, 367649, 367651, 367655, 367659, 367668, 367674, 367687, 367904, 367909, 367930, 367931, 367933
AUTOMOTIVE ENGINEERING
318465, 318514, 318916, 326257, 362427, 367652
AWARENESS
362387, 366801, 366824, 367666
AXLE LOAD
349540

B

BACK PRESSURE
366764
BARRIERS
345110
BARS
361583
BEARING ALLOYS
362403
BEFORE AND AFTER STUDIES
349257, 361671, 362068, 366819, 367143
BEHAVIOR MODIFICATION
367903
BELTS
361057
BENEFIT COST ANALYSIS
347116, 361693, 365157, 366515, 367272, 367657
BENEFITS
348583, 362408, 366782, 366823
BIAS
362073, 366503
BIBLIOGRAPHIES
326060, 326410, 326411, 326433, 361584
BICYCLE ACCIDENTS
367275
BICYCLE RIDERS
361002, 362388, 364988, 367298, 367299, 367699
BICYCLES
348114, 361142, 361684, 362388, 367673
BIKEWAYS
362418, 367673
BIOLOGY
361584
BIOMECHANICS
348114, 366809, 366993, 367637, 367708, 367711, 367715, 367717, 367719, 367720
BLACK SPOTS
361683, 361693
BLINDNESS
366512
BLOOD ALCOHOL LEVEL
318939, 319852, 326259, 349259, 361625, 362136, 362376, 362396, 362417, 366500, 366501, 366778, 366792, 366793, 366794, 366819, 367274, 367291, 367296, 367297, 367301, 367640, 367912, 367914, 367928
BLOOD PRESSURE
367626
BLOOD TESTS
318939, 366792, 367928
BLOWOUTS
362414
BODY
318982, 318984, 318989, 367661
BOTTLENECKS
362418
BRAIN
367638, 367703, 367714, 367723
BRAKE FADE
367665
BRAKE LININGS
362409, 362427, 366771
BRAKES /FOR ARRESTING MOTION/
361675, 362419, 366767, 367623, 367905
BRAKING
361672, 362052, 362377, 362409, 364989, 366510, 367623, 367636
BRAKING FORCE COEFFICIENT
345894
BRAKING LIGHTS
318967, 345815, 362072, 367903
BRAKING PERFORMANCE
366771
BRASSES
366787
BREAKAWAY SUPPORTS
367295
BREAKER POINT IGNITION
362057
BREATH TESTS
318939, 362396, 366521, 366794, 367301, 367928
BREATHALYZERS
366793
BRIDGE ABUTMENTS
367665
BRIDGES
366526
BRIGHTNESS
361272, 361668, 366804, 366983, 367688
BRITISH RAILWAYS
366522
BUDGETING
341628, 362393, 367902
BUMPERS
364990, 367090, 367272, 367711
BUMPS
367684
BURNS /INJURIES/
362063
BUS DRIVERS
346840, 362414
BUS TRANSPORTATION
362366
BUSES /VEHICLES/
346840, 362062, 362402, 367302, 367309, 367669, 367930, 367933
BUSHINGS
362403
BUSINESS
362393
BUSINESS DISTRICTS
348583
BYING
367932

C

CABS /EXCEPT TAXICABS/
349990, 361002
CADAVERS
326457, 326458, 326459, 367637, 367708, 367711, 367712, 367714, 367717, 367719
CAFFEINE
367625
CALIPERS
367905
CAPACITY
348914
CAPITALIZED COSTS
362410
CAR FOLLOWING
361692, 367921
CAR KITS
367285
CARBON DIOXIDE
367700
CARBON MONOXIDE
349986, 366769
CARBURETORS
362425
CARRIERS
365132
CASE STUDIES
318940
CAST ALUMINUM ALLOYS
366995
CAST IRON
362379
CATALOGS /PUBLICATIONS/
318938
CATALYSTS
362392
CAUSES
361623, 367269
CENTRAL BUSINESS DISTRICT
345375
CERTIFICATION
366994, 367104
CERVICAL SPINE
367690, 367694, 367697
CHANGEABLE MESSAGE SIGN
345375
CHANGES
349256, 366991
CHARTS
362400

CHEMICAL ANALYSIS
318982, 362396
CHEMICAL COMPOSITION
367653
CHEMICAL PROPERTIES
362392
CHEST WALL
367715, 367716
CHEVROLET BLAZER
367923
CHILD RESTRAINTS
361634, 362051, 362069, 362075, 362365, 366801, 366802, 366803, 366807, 366821, 366823, 366998, 367097, 367098, 367101, 367105, 367115, 367268, 367277, 367305, 367666, 367717, 367911
CHILDREN
366803, 366807, 366821, 366996, 367098, 367101, 367115, 367291, 367717, 367720
CHLORINE
347818
CHRYSLER CORPORATION
362429, 367107
CITIZEN PARTICIPATION
367103, 367268, 367658
CLAIMS
362380, 362385, 366527, 366528, 366766, 367001, 367088, 367909
CLASSIFICATION
364983, 364987, 367723
CLOSE SHIELDING
366765
CLOSED LOOP SYSTEM
364874, 367106
CLOTHING
366518
CLUTCHES
349988, 366524
COAL
362392
CODES
362394
COEFFICIENT OF FRICTION
362052
COEFFICIENTS
361674
COLD START
366519, 366775, 366776, 366788
COLD WEATHER OPERATIONS
366776, 366788
COLLISION INJURY RESEARCH
326457, 326458, 326459, 362386, 367637
COLLISION RESEARCH
318496, 318916, 318944, 318955, 319852, 326038
COLLISION TESTS
318501, 318515
COLLISIONS
346840, 364983, 366528, 366766
COMBUSTION
349985, 349987, 361058, 367644
COMFORT
318499, 326261, 349990, 364993, 366763, 366802, 366822
COMMERCIAL VEHICLES
362062, 362402, 367259, 367260, 367680
COMMITTEES
367658
COMMUNICATION SYSTEMS
348580, 367308
COMMUNICATIONS
362387, 362393
COMMUNITY ACTION PROGRAMS
367283
COMMUNITY PLANNING
362387
COMMUNITY VALUES
367283
COMPACT CAR
362413, 366766
COMPARATIVE ANALYSIS
366516
COMPARISONS
318944, 366796, 367271, 367717, 367719
COMPATIBILITY
362051, 366973, 367307
COMPENSATION
361623
COMPETITION
326263, 366520, 367292, 367619, 367910
COMPLIANCE
362409, 362410, 362423, 366990, 367308, 367310
COMPLIANCE TESTS
364990, 364993, 367116
COMPONENTS
362064
COMPOSITE MATERIALS
367679
COMPOSITIONS /INGREDIENTS/
367618
COMPREHENSIVE RESEARCH INJURY SCALE
367699
COMPUTER AIDED DESIGN
349989, 361675, 362402, 366764
COMPUTER APPLICATIONS
345286
COMPUTER CONTROL
366974
COMPUTER PROGRAMS
318500, 326261, 362383, 366764, 367096, 367718
COMPUTER SIMULATION MODELS
326457, 326458, 326459, 349989, 362383, 366504, 366510, 366515, 367264, 367937
COMPUTER SIMULATIONS
349986, 362404, 362405, 362406, 362407, 367106, 367287, 367683
COMPUTER STORAGE
362049, 366797
COMPUTERS
366986, 366987, 366988
CONCENTRATION
318984, 318989
CONCEPTS
366565, 366567
CONCRETE BOX GIRDERS
366526
CONFERENCES
319852, 348114, 348653, 361624, 362069, 362131, 362395, 362396, 362397, 366512, 366981
CONFIGURATIONS
367109
CONFORMITY
362389
CONNECTING DEVICES
367924
CONSPICUITY
367259, 367260, 367622
CONSTRAINTS
326259
CONSTRUCTION COSTS
362017
CONSTRUCTION EQUIPMENT
367110, 367651
CONSTRUCTION MATERIALS
326416
CONSTRUCTION SAFETY
345110
CONSTRUCTION ZONE TRAFFIC CONTROL
345110, 346185, 367906
CONSTRUCTION ZONES
345110, 362058
CONSUMERS
318967, 326256, 362051, 362365, 362410, 366507, 366768, 366971, 367104, 367111, 367312
CONTACT PRESSURE
367110
CONTOURS
367688
CONTROL
366790
CONTROL DEVICES
367108, 367621
CONTROL SYSTEMS
364874, 367623
CONTROLLERS
367623
CONVERSION
362392, 367289, 367688

COOLING
349985
COOPERATION
362393
COORDINATES
367688
COPPER
362403, 366787
COPPER ALLOYS
362403
CORRELATIONS
341118, 349261, 361667
CORRIDOR CONTROL
345375
COST ALLOCATIONS
341628
COST ANALYSIS
318514, 318933, 318967, 318976, 366527
COST DATA
366527
COST EFFECTIVENESS
318930, 318962, 361666, 361683, 361693, 362017, 362386, 365135, 366516, 366765, 366787, 366823, 367096, 367293, 367296, 367297, 367315, 367929
COST SHARING
367930, 367933
COSTS
326416, 341628, 348580, 362365, 362366, 362367, 362393, 362408, 362424, 366516, 366782, 366805, 366823, 366973, 366976, 367001, 367261, 367262, 367282, 367293, 367300, 367313, 367619, 367670, 367910
COUNTERMEASURES
318980, 318989, 319852, 326264, 347116, 348957, 349949, 349952, 361577, 361666, 362071, 362136, 362387, 362397, 366565, 366567, 366818, 366996, 367103, 367275, 367648, 367676, 367911, 367915, 367927, 367936
COURTS
326260, 326264, 362070, 366791
CRACKING /FRACTURING/
362399
CRANKING SPEED
366776
CRANKSHAFTS
361057
CRASH DYNAMICS
367718
CRASHWORTHINESS
318916, 318944, 318955, 326038, 361673, 362413, 366980, 367090, 367091, 367300, 367305, 367312
CREEP TESTS
366526
CRIME
367296, 367297, 367659
CRITERIA
367306
CROSS-SECTIONAL ANALYSIS
361691
CROSSWINDS
367680
CRUISING SPEED
367931
CULPABILITY
367274
CURRICULUM
361576
CURVATURE
367921
CYBERNETICS
367920, 367921, 367926
CYCLES
349986
CYLINDER HEAD
361057
CYLINDERS
361058

D

DATA
329138, 362062, 366770, 366782, 367647
DATA ACQUISITION
318940, 319852, 362135, 366505, 366506, 366509, 366565, 366778, 366978, 367096, 367102, 367269, 367295
DATA ANALYSIS
318500, 345286, 361625, 361629, 361670, 362076, 362145, 362384, 364987, 366565, 367269, 367649, 367661
DATA BASE
318465, 318980, 326021, 328908, 345286, 362049, 362383, 366797
DATA NEEDS
367102
DATA PROCESSING
362060
DATA REDUCTION
326025
DATA RETRIEVAL
366797, 367096
DATA STORAGE
366797, 367096
DATA SYSTEMS
345286, 367315
DATA TRANSMISSION
366797
DAY
366982
DAYLIGHT
362076, 367291
DEAFNESS
366808
DEATH RATE
367101
DEBRIS
362394
DECELERATION
367714
DECISION MAKING
361577, 366565, 366991, 367089
DEFECTS
326070, 362064, 362421, 367309
DEFENSIVE DRIVING
367092
DEFERRED PROSECUTION
366785
DEFINITION
362391
DEFORMATION
364983
DELINEATORS /TRAFFIC/
345110
DELINQUENCY
366997
DELIVERY
367142
DEMAND
326263, 367619
DEMOGRAPHIC INFORMATION
367661
DEMOGRAPHIC STUDIES
367661
DEMONSTRATION PROJECT
345375
DENSITY
367618
DEPARTMENT OF TRANSPORTATION
362393, 366972, 367307
DEPRECIATION
367932
DEREGULATION
362138
DESIGN
362141, 362374, 362418, 366763, 366764, 366765, 366773, 366775, 366789, 367107, 367143, 367285, 367288, 367295, 367705
DESIGN CRITERIA
349990, 362017, 367643
DESIGNING
366979, 366980, 366993
DETECTING DEVICES
366778, 366793
DETECTION
318982
DEVELOPING COUNTRIES
349535, 361666, 362049, 362395, 367689, 367935
DEVELOPMENT
367935

DIAGNOSIS
366816, 367112, 367621, 367631, 367904
DIAGNOSTIC CLINIC TESTS
362419
DIAGONAL BRAKE SYSTEM
367905
DIAGRAMS
367688
DIESEL ENGINES
362426, 366765, 366773, 366776, 366788, 366820, 367288, 367923
DIESEL FUELS
362378, 366776, 366788
DIESEL TRUCKS
362062
DIFFERENCES
362389
DIGITAL TECHNIQUES
366510
DIRECT COSTS
362410
DIRECT CURRENT
367633
DIRECTIONAL SIGN
347826
DISABILITY
366512, 367691, 367692, 367694, 367710
DISABLED DRIVERS
362398, 366976
DISABLED VEHICLES
367119
DISABLING INJURY
367691, 367692, 367698, 367703
DISADVANTAGED
366997
DISASSEMBLY/ENGINES
367904
DISCOUNT
362380
DISCRETE MULTIVARIATE ANALYSIS
362061
DISPLACEMENT
367716
DISPLAYS
366986, 366987
DISTANCE
366982
DISTORTION
367716
DOOR LATCHES
367646, 367649, 367650
DOOR OPENING
362416, 367646
DOORS
318514, 362384
DOWNGRADE
367929
DRAG
361674, 367287, 367680
DRAG FACTOR
367643
DREW ENERGY MODEL
362059
DRINKING DRIVER
318939, 318983, 318984, 319852, 326251, 326259, 361584, 362069, 362071, 362136, 362394, 362395, 362396, 362397, 362411, 362417, 366500, 366508, 366513, 366785, 366790, 366791, 366793, 366795, 366798, 366818, 366989, 367089, 367103, 367278, 367283, 367284, 367301, 367304, 367625, 367627, 367638, 367648, 367912, 367914, 367915, 367917, 367925, 367934
DRIVE SHAFTS
366816
DRIVER AGE
326021, 348578, 348914, 361668, 362411, 366800, 366825, 366977, 366983, 367617, 367675, 367912
DRIVER BEHAVIOR
318984, 326021, 326264, 347822, 348939, 349138, 349535, 361142, 361690, 361694, 362073, 362135, 362417, 366981, 366984, 366985, 367284, 367624, 367642, 367685, 367907, 367914, 367917, 367920, 367921, 367926, 367927
DRIVER CHARACTERISTICS
349261, 349999, 367685
DRIVER EDUCATION
362394, 367927
DRIVER FATIGUE
361690, 366988
DRIVER IMPROVEMENT
367092, 367686
DRIVER IMPROVEMENT EFFORT
367000
DRIVER INFORMATION SYSTEMS
345375, 348580
DRIVER INVESTIGATION
367665
DRIVER KNOWLEDGE
362058, 367642
DRIVER LICENSE DENIAL
362048
DRIVER LICENSE EXAMINATION
341419
DRIVER LICENSE STANDARDS
362138
DRIVER LICENSE SUSPENSION
349259, 362071, 362376, 367306, 367654
DRIVER LICENSING
326021, 362048, 362382, 362388, 362391, 362394, 366800, 366977, 367271, 367304, 367306, 367315, 367927
DRIVER PERCEPTION
326030, 346185, 348578, 362138
DRIVER PERFORMANCE
318984, 318989, 326021, 326030, 326032, 326261, 348578, 349535, 361576, 361584, 361667, 361690, 366777, 366778, 366785, 366811, 366813, 366814, 366988, 366992, 367264, 367280, 367617, 367662, 367685, 367686
DRIVER PSYCHOLOGY
348578, 361584, 367685, 367917
DRIVER REACTION
348578, 348939, 362069, 362416, 367094, 367685, 367686
DRIVER RECORDS
367308, 367315
DRIVER RESTRICTION
367089

DRIVER TRAINING
326021, 326032, 341419, 348578, 348932, 361576, 362065, 362069, 367642, 367927
DRIVER TRAINING WITH SIMULATORS
366808, 367092
DRIVER VISION
326030, 345815, 348578, 361140, 361668, 362058, 366981, 367304, 367916
DRIVERS /VEHICLE/
318939, 318982, 318983, 318984, 318989, 319852, 326021, 326030, 326032, 326251, 326261, 326410, 326411, 341419, 362073, 362390, 366521, 366762, 366800, 366802, 366982, 366985, 366992, 367639, 367693, 367695, 367696
DRIVING
362401, 366769, 366811, 366992, 367117, 367616, 367625, 367626, 367685, 367686, 367916, 367920, 367921, 367926
DRIVING CONDITIONS
366769, 367094
DRIVING HABITS
367092, 367642, 367685, 367686, 367687
DRIVING RECORDS
349261
DRIVING SIMULATION
348578, 367106
DRIVING UNDER THE INFLUENCE
318982, 318983, 318984, 318989, 326410, 326411, 349259, 361584, 361666, 362071, 362376, 362417, 366500, 366508, 366513, 366778, 366785, 366790, 366791, 366793, 366795, 367103, 367296, 367297, 367917, 367934
DRUGS
318982, 318983, 318984, 318989, 326410, 326411, 362069, 362395, 362396, 362397, 366513, 366793, 366813, 366814, 366824, 366989, 367274, 367280, 367625, 367640
DRUM BRAKES
366771, 366973
DUMMIES
326457, 326458, 326459, 367637, 367683, 367708, 367717, 367718, 367720
DURABILITY
349985, 362399, 367932

DURENE
362392
DUSE
367622
DYNAMIC MODELING
366974
DYNAMICS
349031
DYNAMOMETERS
362419

E

EARLY INTAKE VALVE CLOSING ENGINES
367108
ECONOMETRIC MODEL
349081
ECONOMIC IMPACT
367910, 367912
ECONOMICS
329138, 341628, 366511, 367657
EDUCATION
318500, 341419, 362376, 362397, 367114, 367265, 367266, 367267, 367648, 367659, 367927
EFFECTIVENESS
318499, 318935, 318940, 318962, 341419, 349257, 361577, 362071, 362076, 362370, 362408, 366501, 366503, 366513, 366516, 366785, 366986, 367000, 367102, 367119, 367264, 367268, 367296, 367297, 367301, 367634, 367635, 367646, 367650, 367654, 367680, 367906, 367911, 367915, 367927
EFFICIENCY
362374, 366765, 367268, 367279
EJECTION
367100, 367276, 367646, 367649, 367650, 367665
ELDERLY
326021, 366979, 367291
ELDERLY DRIVERS
367617, 367675
ELECTRIC AUTOMOBILES
318916
ELECTRIC BRAKES
366781, 367924
ELECTRIC VEHICLES
318496, 318944, 318955, 362378, 366796, 367287, 367677
ELECTRICAL EQUIPMENT
367116
ELECTROENCEPHALOGRAPHS
361690
ELECTROMAGNETIC INTERFERENCE
362053
ELECTRONIC CONTROL
349988, 367112, 367621
ELECTRONIC DEVICES
366986, 366987, 367099, 367112
ELECTRONIC FUEL INJECTION
367287
ELECTRONIC IGNITION
362057, 366532
ELECTRONIC MEANS
348580
ELECTRONICS
366797, 367677
EMERGENCY
326379, 364847, 366565, 367142
EMERGENCY CALL SYSTEMS
362372, 366514
EMERGENCY MEDICAL TECHNICIANS
367628
EMERGENCY SERVICES
362394, 367628, 367638
EMISSION CONTROL
337124, 337125, 337126, 337182, 364874, 366820, 367678
EMISSIONS
326432, 366515
EMPLOYMENT
367910
ENERGY
362366, 366522, 367287
ENERGY ABSORBING BUMPERS
367090, 367091
ENERGY ABSORPTION
326318, 349811, 362428, 367705, 367706, 367707, 367711
ENERGY CONSERVATION
349999, 362055, 362058, 362418, 362426, 366986
ENERGY CRISIS
367677
ENERGY EFFICIENCY
366817
ENERGY METHODS /STRUCTURAL/
367698
ENFORCEMENT
347695
ENGINE BLOCK HEATERS
366788
ENGINE CAPACITY
367292
ENGINE KNOCK
366767
ENGINE MAPPING
367678
ENGINE NOISE
362429, 366765, 366767
ENGINE POWER LOSS
367931
ENGINES
348914, 362056, 362374, 366974, 367904
ENVIRONMENT
341419, 366512, 367264
ENVIRONMENTAL DATA
367912
ENVIRONMENTAL EFFECTS
366526
ENVIRONMENTAL IMPACT
348583, 361098, 362272, 366782, 366820, 367632
ENVIRONMENTAL IMPACT STATEMENT
361098
EPIDEMIOLOGY
318983, 362395, 366501, 366513, 366517, 367672, 367689, 367694, 367698, 367925
EPILEPSY
362048
EQUATIONS
349261, 361683, 361689, 367688, 367920, 367921, 367926
EQUIPMENT
367290, 367628
EQUITY
367930, 367933
ERGONOMICS
362402, 366979, 366987, 366993
ERRATIC DRIVING BEHAVIOR
367907
ERRORS
349540, 366503, 366507
ESCAPE LANES
367929
ESSENTIAL ELEMENTS EXAMINATION
366972
ESTIMATES
347116, 362145, 366503, 366795
ESTIMATING
349535, 366805, 367647
EUROPEAN TECHNOLOGY
367107, 367643
EVACUATION
361577
EVALUATION
318464, 318465, 318502, 318935, 318962, 326058, 326379, 349949, 362371, 362408, 367000, 367681
EVOLUTION
367290
EXAMINATION
318939
EXCLUSIVE PHASING
362068
EXEMPTION
362369
EXHAUST EMISSION CONTROL
362055, 366775
EXHAUST EMISSIONS
326429, 337124, 337125, 337126, 337182, 349986, 361675, 361676, 362055, 362272
EXHAUST GAS RECIRCULATION
349985, 366772

EXHAUST SYSTEMS
362056, 366764
EXPENDITURES
341628, 366522, 367279, 367619
EXPERIENCE
348914
EXPERIMENTS
366772, 367919
EXPORTS
362062
EXPOSURE
361695
EYE FIXATIONS
366982, 366987
EYES
367721

F

FACE
367693, 367713
FACTOR ANALYSIS
366811
FAILURE MECHANICS
367109
FALL FROM MOTOR VEHICLE
366807
FATAL ACCIDENT REPORTING SYSTEM
367276
FATAL ACCIDENTS
319852, 345286, 346840, 349256, 349261, 361002, 361689, 362077, 362139, 366800, 367276, 367291, 367664, 367665, 367934
FATALITIES
318464, 318506, 326250, 326349, 347138, 361634, 361666, 361670, 362063, 362075, 362382, 362413, 362420, 366521, 366529, 366774, 366801, 366802, 366803, 366807, 366819, 366821, 366977, 366980, 366996, 367100, 367115, 367273, 367305, 367311, 367624, 367629, 367634, 367635, 367638, 367639, 367650, 367673, 367676, 367693, 367912, 367936
FATIGUE STRENGTH
367110
FEASIBILITY
326252, 326259
FEASIBILITY STUDIES
362065, 364990, 365157
FEDERAL AGENCIES
367902
FEDERAL MOTOR VEHICLE SAFETY STANDARDS
367902
FEDERAL PROGRAMS
364847, 366527, 366972, 366976, 367902, 367903
FEEDBACK
348653, 366986
FEMALE DRIVERS
349138, 349999, 366983
FEMALES
362063, 366762
FERROUS MATERIALS
367653
FIELD INVESTIGATIONS
366503
FIELD OBSERVATION
366813, 366984, 366985, 367907
FIELD OF VIEW
361140
FIELD STUDIES
362415
FIELD TESTS
366569, 366986, 367259, 367657, 367684, 367929
FINANCING
367619, 367910
FINES /PENALTIES/
326252, 349259, 367308
FINITE ELEMENT METHOD
366783
FIRE
362063, 367629
FIRE RESISTANCE
367644
FIRE/NON-CRASH RELATED/
367088
FIRES
346840, 366815
FIRST AID
361702, 362390
FITTINGS
367652
FLAMEPROOFING
366815
FLASHERS
366985, 367116, 367119
FLASHING TRAFFIC SIGNAL
361671
FLAT SPOTS/ACCELERATION/
366775
FLEXIBLE HOURS
362418
FLUID CONDUCTORS
367652
FLUID CONNECTORS
367652
FLUIDS
318982, 318984, 318989
FOAMS
364990
FOG
345815
FOLLOWING DISTANCE /OF VEHICLES/
362072
FOOT
361669
FORCE
362414
FORCES
367684
FORD MOTOR COMPANY
362429, 367107, 367287, 367621
FORECASTING
349930, 367692
FORECASTS
362062
FOREIGN COUNTRIES
329138, 362375
FOREIGN TRADE
366520
FOREIGN VEHICLES
362373, 367292
FORENSIC STUDIES
367618
FOUR LANE HIGHWAYS
367906
FOUR WHEEL DRIVE
362052, 367667
FRAUD
367001
FREEWAY CAPACITY
366509
FREEWAY ENTRANCES AND EXITS
367907
FREEWAY SIGNS
362058
FREEWAYS
367906
FREIGHT TRANSPORTATION
347695, 347818, 361098, 361624, 362366, 366522, 367142
FRICTION
361057, 361534, 367108
FRICTION TESTS
326318
FRICTIONAL COEFFICIENT
367110
FRONT PASSENGERS
367695, 367696
FRONT SEAT
367694
FRONT WHEEL DRIVE
362373, 366766, 366779, 367099
FRONTAL COLLISIONS
361669, 361673, 362383, 364993, 367100, 367269, 367637, 367695, 367696, 367697, 367698, 367708, 367717, 367719
FUEL CONSUMPTION
318464, 318465, 318502, 318506, 318933, 318967, 326060, 326263,

326429, 326432, 337124, 337125, 337126, 337182, 348957, 349985, 349986, 349999, 361058, 361331, 361583, 361676, 362050, 362365, 362369, 362404, 362405, 362406, 362407, 364874, 366504, 366507, 366511, 366515, 366764, 366772, 366796, 366817, 366975, 366986, 367107, 367108, 367281, 367287, 367292, 367293, 367302, 367619, 367678, 367679, 367923
FUEL INJECTION
362374, 366773, 366775, 367288
FUEL LINE HEATERS
366776
FUEL PUMPS
366767, 367631
FUEL SYSTEMS
362419, 367631
FUELS
326060, 362378, 362412, 367282, 367287
FUND ALLOCATIONS
362372
FUNDING
367902
FUTURE CONCEPTS
367290
FUTURE RESEARCH
361331, 362065, 362135, 367637

G

GALVANIZING
367118
GAP ACCEPTANCE
349138
GAS TURBINE ENGINES
367677
GASES
349987
GASOLINE
362063, 362392, 367660
GENERAL MOTORS CORPORATION
364985, 366767, 366775, 366776, 366780, 366788, 367118, 367286, 367288, 367905, 367923
GEOMETRIC DESIGN
361671, 362058, 362422, 367688
GLARE
361668, 362074, 366983
GLASS
367095, 367618
GLASS FIBERS
367630
GLASS REINFORCED PLASTIC
367705
GLOW PLUGS
366776, 366788
GONIOMETRY
367661
GOODS MOVEMENT
347818
GOVERNMENTAL PROCESSES
366971
GRADE /SLOPE/
366537, 367929
GRADE CROSSING SIGNALS
362058
GRADING
361523
GRANT IN AID
362367
GRAPHIC METHODS
367688
GROSS COMBINED WEIGHT RATING
367923
GUIDANCE SYSTEMS
348580
GUIDE SIGNS
347826
GUIDELINES
361576, 367002, 367098, 367307
GUIDES
348583, 362420, 367265, 367266, 367267

H

HABITUAL TRAFFIC VIOLATOR
367654
HANDICAPPED INDIVIDUALS
362048, 362398, 366512, 366976, 366979, 367656
HANDLING
326023
HAZARDOUS MATERIALS
347695, 347818, 361624, 364847, 366565, 367002, 367142
HAZARDS
318976
HEAD
347917, 361623, 366819, 367634, 367635, 367641, 367683, 367693, 367699, 367704, 367705, 367706, 367709, 367713, 367714
HEAD ON COLLISIONS
318496, 318916, 318955, 361671, 366770, 367274
HEAD RESTRAINTS
362386, 367697
HEAD TRAUMA
362048, 362371
HEADLIGHT GLARE
318989
HEADLIGHTS
362076, 367107, 367618
HEADRESTS
361633
HEADWAY
361692, 361694, 366509, 366784, 366984, 367636, 367907
HEALTH
341419, 348583, 361098
HEART
367715, 367716
HEAT RESISTANCE
361675
HEAT TRANSFER
349985
HEAVY EQUIPMENT
362049
HEAVY VEHICLES
349990, 361002, 361684, 367650, 367930, 367933
HEIGHT
362072
HELMETS
347917, 361702, 362370, 362371, 362391, 362428, 366505, 366506, 366819, 366990, 366994, 367277, 367634, 367635, 367638, 367641, 367699, 367700, 367701, 367702, 367703, 367704, 367705, 367706
HESITATION/ENGINE
366519, 367931
HIGH ACCIDENT LOCATIONS
349949, 349952
HIGH STRENGTH LOW ALLOY STEELS
366995
HIGH STRENGTH STEELS
367262, 367630
HIGHWAY CAPACITY
362418
HIGHWAY DELINEATION
362136
HIGHWAY DESIGN
349952, 362017, 362138, 367688
HIGHWAY LIGHTING
345110, 361272, 361629, 362058
HIGHWAY MAINTENANCE
345110, 348376, 349811
HIGHWAY SAFETY
318500, 318982, 318983, 318984, 318989, 326264, 326410, 326411, 349952, 361693, 362131, 362367, 362370, 362387, 362393, 362431, 366981, 367270, 367278, 367307, 367664
HIGHWAY SIGNS
326379
HIGHWAY TAXATION
341628
HIGHWAY TRANSPORTATION
367142
HIGHWAY USER COSTS
341628
HIGHWAY USER TAXATION
367930, 367933
HIGHWAYS
341419
HINGES
367646

HISTORY
367667
HITCHES
367922, 367924
HOME MECHANICS
366531, 366767, 366776, 366788, 366789, 366810, 367112, 367621, 367631, 367633, 367922, 367931
HOOD
367711
HORNS
367701
HOSES
367652
HOT AIR
349987
HUMAN ENGINEERING
366993
HUMAN FACTORS
318935, 318982, 318983, 318984, 318989, 326032, 326410, 326411, 341419, 346185, 347826, 348578, 362138, 365157, 366981, 367936
HYBRID VEHICLES
366796, 367677
HYDRAULIC BRAKES
362409
HYDROCARBONS
349986, 367282
HYDROGEN
349987
HYPOTHESES
366795

I

ICE
349930, 367094
IDENTIFICATION
361683
IDENTIFYING NUMBER
362049
IDLING
367302
IGNITION
349987
IGNITION SYSTEMS
362053, 362054, 362057, 362419
IMPACT
326263, 367704, 367705, 367706, 367713, 367715
IMPACT ATTENUATORS
349811
IMPACT EXTRUSION
367710
IMPACT FACTOR
367710
IMPACT STUDIES
362370
IMPACT TESTS
318944, 318955, 326038, 348114, 349811, 364993, 366505, 366506, 367090, 367091, 367683, 367709, 367711, 367714, 367718, 367719
IMPAIRED DRIVERS
362066, 367089, 367304
IMPLEMENTATION
362372, 366516, 367910
IMPLIED CONSENT
362417, 367301, 367928
IMPORTS
362062, 367910
IMPROVEMENT
341419, 349952, 361058, 361331, 367270
INCENTIVES
329138, 367268
INDICATORS /INSTRUMENTATION/
367633
INDIRECT COSTS
362410
INDONESIA
367935
INDUSTRIAL ACCIDENTS
367629
INDUSTRIES
367142
INDUSTRY
362393
INFANTS
362051, 366529, 366801, 366803, 367105
INFLUENCE FACTORS
366508, 366798
INFORMATION DISSEMINATION
318938, 366507, 367270, 367277, 367278
INFORMATION SYSTEMS
345286, 361675
INFRARED
366794
INFRASTRUCTURE
366522
INHIBITORS
366815
INJURIES
318464, 318980, 319852, 326250, 326349, 345898, 347116, 347138, 347917, 348114, 349256, 361002, 361523, 361623, 361633, 361634, 361666, 361669, 362063, 362067, 362075, 362141, 362145, 362371, 362376, 362382, 362384, 362386, 362393, 362401, 362420, 362430, 364987, 366518, 366521, 366770, 366799, 366801, 366802, 366819, 366978, 366980, 366996, 367100, 367101, 367269, 367273, 367276, 367305, 367624, 367629, 367634, 367635, 367637, 367638, 367639, 367641, 367647, 367676, 367690, 367691, 367692, 367693, 367694, 367695, 367696, 367697, 367698, 367699, 367702, 367703, 367704, 367705, 367706, 367707, 367708, 367709, 367710, 367711, 367712, 367713, 367714, 367715, 367716, 367719, 367720, 367721, 367722, 367723, 367936
INJURY SEVERITY SCORE
367691, 367692
INLETS
362374
INSPECTION
326069, 326070, 362391, 365132, 365135, 366972, 367904
INSPECTION PROCEDURE
366524, 366525, 366972, 367631, 367668, 367669, 367687
INSTABILITY
366771
INSTALLATIONS
366780
INSTALLING
362051, 366789, 367105, 367633, 367922, 367924
INSTRUMENTATION
367301
INSURANCE
362385, 362388, 362390, 362391, 362397, 362398, 366527, 366528, 366766, 367001, 367088, 367091, 367095, 367662, 367909
INTAKE SYSTEMS
362056
INTAKE VALVES
367108
INTERGOVERNMENTAL RELATIONS /U.S./
367002
INTERIOR
341118, 349990, 366783
INTERLOCK DEVICES
364985
INTERNAL COMBUSTION ENGINES
318944, 362053, 362054, 364874, 366796
INTERNATIONAL COOPERATION
367689
INTERNATIONAL STANDARDS
367116
INTERSECTION CAPACITY
348957
INTERSECTIONS
348957, 349952, 362136, 367675
INTERVIEWS
318499, 366989, 367000, 367902
INTOXICATION TESTS
367928
INTRUSION
367276
INVENTIONS
367286
INVESTIGATIONS
367659
INVESTMENTS
329138
IRON
367653

J

J-CARS
366531, 367905
JAILS
349259, 362376
JAPAN
366786
JAPANESE TECHNOLOGY
366980, 367643
JEEPS
362401
JERK VALUES
367714
JUDGES
367265, 367266, 367267
JUST-IN-TIME PRODUCTION
366786

K

KANBAN PROCEDURE PRINCIPLE
366786
KINEMATICS
326457, 326458, 326459, 367682, 367702, 367707, 367708, 367711, 367714, 367717, 367718, 367719
KINETIC ENERGY
367715, 367716
KNOWLEDGE
349535, 361667

L

LABELS
366507
LABORATORY TESTS
366813, 366986, 367660, 367684, 367914
LAMINATED GLASS
367713, 367721
LAMINATES
367630
LAND USE
361331
LANE CHANGE
367106, 367907
LANE CLOSING
367906
LAP BELTS
367720
LAP-DIAGONAL SEAT BELTS
367693, 367695
LATERAL PLACEMENT
366999, 367921
LAW ENFORCEMENT
318940, 318989, 362049, 362055, 362070, 362396, 366792, 366797, 367103, 367296, 367297, 367298, 367299, 367301, 367308, 367648, 367659, 367666
LAWS
318939, 318940, 318989, 326260, 326264, 361634, 362066, 362072, 362075, 362076, 362272, 362370, 362371, 362372, 362376, 362380, 362388, 362390, 362391, 362402, 362417, 362431, 366501, 366513, 366516, 366785, 366792, 366812, 366819, 366823, 366984, 366991, 366998, 367002, 367115, 367142, 367301, 367634, 367648, 367911, 367913, 367928
LAYOUT
362067
LEADED GASOLINE
362426
LEAKAGE
365132, 365135
LEATHER
366518, 367722
LEFT TURN
362068, 367143
LEFT TURN PHASING
366515
LEG
361669, 367703, 367707, 367710, 367711
LEGAL ACTION
366790, 366791, 367928
LEGAL ASPECT
318939, 326251, 326252, 326260, 326264, 361624, 362417, 367286, 367657
LEGAL DRINKING AGE
362411, 366806, 366991, 367627
LEGAL RESPONSIBILITY
318980, 362066
LEGAL STUDIES
366823
LEGIBILITY
347826, 361668
LEGISLATION
362055, 362394, 366527, 366768, 366976, 367090, 367095, 367097, 367103, 367105, 367111, 367659
LENGTH
364989, 367907
LETTERS
347826, 367000
LEVEL OF SERVICE
345110
LIABILITY
326252, 362066, 362388
LIFE-CYCLE COSTING /LCC/
366796
LIFT WINDOWS
366780
LIGHT STANDARDS
367295
LIGHT TRUCKS
326058, 326250, 328908, 347138, 362369, 362384, 362404, 362405, 362406, 362407, 362420, 364983
LIGHT VEHICLES
366820
LIGHTING EQUIPMENT
367633, 367651, 367924
LIGHTWEIGHT AGGREGATES
361583
LIGHTWEIGHT MATERIALS
326058, 362379, 367630, 367679
LILLE METRO
367712
LINEAR PROGRAMMING
361693
LINEAR REGRESSION
362060
LIQUID PETROLEUM GAS
347818
LITIGATION
348376
LOAD DISTRIBUTING HITCHES
367922
LOADING
367142
LOADS
349999, 367109, 367684
LOAN PROGRAM /CHILD RESTRAINTS/
367911
LOCAL GOVERNMENT
362372, 362393, 364847, 367002, 367658
LOCAL PARTICIPATION
367658
LOCAL STREET
367291
LOCAL TRAFFIC
367632
LOCATIONS
362462
LOCKED-WHEEL
364989
LOG-LINEAR MODELS
362061
LOGIT MODELS
362061
LONDON TRANSPORT
366522
LONG TERM
367710
LOOP DETECTORS
361684
LORAN
318931
LOSSES
349985, 361057, 366528
LOW BEAMED HEADLIGHTS
366502

LOW DRAG
367905
LUBRICATING OILS
366826
LUMINAIRES
367295
LUMINOUS INTENSITY
366804, 366983, 367688

M

MACPHERSON STRUTS
366533
MACROSCALE
367937
MAGNESIUM
366995
MAINTENANCE
362057, 365132, 365135, 366776, 366781, 366788, 366973, 367288, 367631
MAINTENANCE COSTS
318967, 348376
MAINTENANCE FACILITIES
367674
MAINTENANCE OPERATIONS
366524, 366525, 366767
MALE DRIVERS
349138, 349999, 366778, 366983, 367624
MALES
362063, 366762
MANAGEMENT
366786, 367902
MANAGEMENT SYSTEMS
347695
MANDATORY SENTENCING
367103
MANIFOLDS
362379
MANUALS
318500, 362387, 367304, 367314
MANUFACTURING
347695, 362056, 362062, 367679
MAPS
348580
MARIHUANA
366778, 367274, 367625
MARKET RESEARCH
326256, 326257, 326263, 328908
MARKETS
366511, 367619
MARKINGS
364989
MASS TRANSPORTATION
366522
MASSACHUSETTS
367659
MASTER CYLINDERS
367905
MATERIALS
362412, 366995, 367113, 367261, 367262
MATERIALS EVALUATION
366995, 367705
MATERIALS SPECIFICATIONS
367261
MATHEMATICAL MODELS
326416, 349930, 361672, 362069, 362415, 366762, 366763, 366770, 366772, 366784, 366828, 367682, 367709, 367717, 367718, 367920, 367921, 367926
MAXIMIZATION
367109
MEAN TIME SPEED
362059
MEASUREMENTS
341118
MEASURING
326030, 361576, 361667, 362135, 364989
MEASURING INSTRUMENTS
326023, 326024, 326025, 326260, 366794
MECHANICAL ANALYSIS
362422
MECHANICAL EQUIPMENT
326251
MECHANICAL PROPERTIES
367110
MECHANICS
361623, 367099, 367104, 367289, 367290, 367674
MEDIA
326069
MEDIAN BARRIERS
361331
MEDICAL ADVISORY BOARDS
362066, 367304
MEDICAL ASPECTS
361584, 366512
MEDICAL CONDITIONS
362048, 362069, 367089, 367304
MEDICAL DISABILITY
362048
MEDICAL SERVICES
326379, 348376
MEDICINE
362048, 367625
MENTALLY RETARDED INDIVIDUALS
362065
MERGING CONTROL SYSTEM
367906
MESOSCALE
367937
METALS
362063
METHANOL
347818, 362392
METHODOLOGIES
366805, 367644
METHODS
348932, 366565, 366790
METRIC SYSTEM
367289
METROPOLITAN GOVERNMENT
367142
MICROCOMPUTERS
367112, 367314, 367621
MICROPROCESSORS
361684, 367112, 367621, 367636
MICROSIMULATION
367937
MILEAGE
366775, 367932
MINICOMPUTERS
367688
MINOR INJURIES
367698
MINORITY GROUPS
367620
MINORS
362075
MIRRORS
361140, 361674
MOBILE EQUIPMENT
367313
MOBILITY
326021, 362398
MODELS
349949, 361331, 361692, 361693, 366974
MOLECULAR STRUCTURE
367110
MONITORING
326251, 366778, 367102
MOPED DRIVERS
362391, 367704, 367706
MOPEDS
362050, 362391, 367309
MOTION STUDIES
367709
MOTIVATION
326252
MOTOR CARRIERS
367302
MOTOR VEHICLE ACCIDENTS
345898, 347138, 362063, 362075, 362141, 366777, 366821, 367098, 367101, 367274, 367305, 367624, 367629, 367637, 367639, 367641, 367646, 367663, 367912

MOTOR VEHICLE LAWS & REGULATIONS
362369, 362375
MOTOR VEHICLES
318502, 318933, 318962, 318967, 326023, 326256, 326416, 326432, 326433, 361672, 361673, 362055, 362062, 362272, 362398, 362403, 362431, 364990, 366522, 367116, 367309, 367313, 367639, 367651
MOTORCYCLE DRIVERS
318980, 347917, 348914, 361002, 362370, 362371, 362382, 362428, 366518, 366523, 366800, 366819, 366994, 367634, 367638, 367699, 367700, 367701, 367704, 367705, 367706, 367722, 367927
MOTORCYCLE RIDERS
367927
MOTORCYCLES
318980, 348114, 348932, 362063, 362069, 362076, 362382, 362394, 366523, 367116, 367309, 367635, 367638, 367641, 367651, 367912
MOUNTING
362072
MOVING VEHICLES
366807
MOVING VIOLATIONS
326259
MULTINOMIAL LOGIT MODELS
362061
MULTIPLE PURPOSE VEHICLES
362384
MULTIPLE REGRESSION
349081, 349999, 362060
MULTIVARIATE ANALYSIS
366988

N

NARROW BRIDGES
367907
NATIONA HIGHWAY TRAFFIC SAFETY ADMINISTRATION
367903
NATIONAL ACCIDENT SAMPLING SYSTEM
362069, 362430, 364983, 364987, 366569, 367102, 367273
NATIONAL CRASH SEVERITY STUDY
367276
NATIONAL DRIVER REGISTER
367308, 367315
NATIONAL ELECTRONIC INJURY SURVEILLANCE SYSTEM
362371
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
367902
NATURAL GAS
362378
NEAR MISS ACCIDENTS
367936
NECK
361633, 367100, 367697, 367714
NEW SYSTEMS
367286
NEWTON-RAPHSON ALGORITHM
362061
NIGHT
349261, 361272, 362136, 366982, 367291, 367294, 367622
NIGHT VISIBILITY
361668, 366502
NIGHT VISION
362074, 366983
NITROGEN OXIDE
349986, 366820
NO FAULT INSURANCE
366527, 366812
NOISE /SOUND/
361675, 362429, 366767, 366783
NOISE CONTROL
362054, 362055, 362059, 362373, 366764, 366765, 366767
NOISE LEVELS
361057, 361676, 362054, 367701
NOISE POLLUTION
362055
NOMOGRAPHS
362059
NONDESTRUCTIVE TESTING
326069, 326070
NONFERROUS METALS
367653
NONPENETRATING IMPACT
367715, 367716
NONPROFIT ORGANIZATIONS
366818
NONRESIDENT VIOLATOR COMPACT
318930
NOSE ANGLE
367655
NOVICES
362382

O

OBSTACLES
367704
OCCUPANT RESTRAINT
362384, 366529, 366801, 366977, 366980, 367097, 367276, 367277, 367305, 367311, 367312, 367624, 367650, 367697, 367698
OCCUPANTS
345898, 361670, 362141, 362381, 366503
OCTANE RATING
362392, 367660
OFF-THE-ROAD
362052, 362401
ON BOARD
366986
ON THE SCENE ACCIDENT INVESTIGATION
367298, 367299
ONBOARD
366987, 366988
ONBOARD COMPUTERS
366775
ONLINE COMPUTERS
361675, 366778
OPERATING COSTS
318967, 367662
OPTIMIZATION
364874
OPTIMUM DESIGN
349986
OPTIMUM SPEED
366805
ORGANIZATIONS
362393
ORGANIZING
367658
OUT OF SERVICE
366972
OVERDRIVE
367923
OVERTURNING
365132, 365135
OWNERS
367114
OZONE
362399

P

PAINTING
367104, 367118
PARAMEDICS
367628
PARKED VEHICLES
362416, 367119
PARKING
362398, 367673
PARKING LOTS
362067
PART-TIME FOUR WHEEL DRIVE
362052
PARTICULATES
366820
PARTS
367263
PASSENGER MILES
362077
PASSENGER TRANSPORTATION
366522
PASSENGERS
347138, 349999, 366762, 366798, 367638
PASSING
367907
PASSIVE RESTRAINTS
364993, 366516, 367102, 367305, 367311, 367657

Retrieval Term Index

PATENTS
367286
PATHOLOGY
367690
PAVED SHOULDERS
347822
PAVEMENT DESIGN
349540
PAVEMENT SURFACE TEXTURE
345894
PAYMENT
367088
PEAK HOUR TRAFFIC
361694
PEDAL
366993
PEDESTRIAN ACCIDENTS
319852, 326457, 326458, 326459, 361625, 361671, 362067, 362383, 366521, 367269, 367275, 367291, 367624, 367637, 367708, 367710, 367711, 367719, 367912
PEDESTRIAN PROTECTION
361002, 364988, 364990
PEDESTRIAN SAFETY
349256, 361331, 362067, 364988, 367298, 367299
PEDESTRIAN VEHICLE CONFLICTS
361331
PEDESTRIANISATION
348583
PEDESTRIANS
319852, 361331, 362394
PELVIS
367720
PENALTIES
326252, 349259, 362390
PENDAIR SYSTEM
367913
PERCEPTION
341118
PERFORMANCE
318931, 318944, 318980, 361675, 362050, 362052, 362428, 366764, 366775, 366999, 367090, 367095, 367285, 367292, 367700, 367923
PERFORMANCE EVALUATION
366779, 366973
PERFORMANCE TESTS
318496, 326023, 326030, 326432, 362392, 362400, 362401, 362409, 367285, 367312
PERIPHERAL VISION
345815
PERMISSIVE PHASING
362068
PERSONNEL
367313
PERSONNEL MANAGEMENT
367296, 367297
PERSONNEL TRAINING
362071, 364847, 364983, 364987, 367296, 367297
PERSPECTIVE VIEWS
367688
PERSPECTIVES
367921
PHARMACOLOGIC EFFECT
367914
PHARMACOLOGY
362397
PHOTOMETRICS
366502, 367651
PHYSICAL PROPERTIES
367110
PHYSICIANS
362048, 362066, 362398, 366801, 367089, 367101, 367304
PHYSIOLOGICAL ASPECTS
348578, 362397
PHYSIOLOGICAL EFFECTS
367700
PICKUPS
318501, 318506, 318515, 347138, 366528, 367284, 367909
PILOT STUDY
318962
PIPELINES
362366, 366522
PISTON RINGS
367113
PISTONS
361057
PLACEBO
367914
PLANNING
362387, 362418, 362424, 364847, 366782
PLANTS /BOTANY/
367282
PLASTIC MATERIALS
362379, 366995
PLASTICS
366815, 367110, 367261, 367262, 367287, 367630
PLOTTERS
367688
PNEUMATIC SYSTEMS
349988
POISSONS DISTRIBUTION
362061
POLICE
362396, 366503, 366790, 366791, 366792, 366794, 366797, 367296, 367297, 367298, 367299, 367671
POLICE CARS
361583, 367281
POLICE IDENTIFICATION NUMBER
362049
POLICY
361577, 366511, 366512, 366782, 366800, 367298, 367299, 367689, 367936
POLICY ANALYSIS
367279, 367910
POLITICS
367656
POLLUTANTS
362272
POLLUTION
366522
POLYCARBONATE
367705
POLYESTERS
367630
POLYMERS
364990, 367110, 367644
POLYURETHANE
364990
POPPER TESTS
367903
PORTABLE EQUIPMENT
362070
POTASSIUM COMPOUNDS
362427
POTHOLES
367117
POWER
337124, 337125, 337126, 337182
POWER PLANTS
361676
POWERTRAINS
367292
PREDICTIONS
326023, 349261, 361689, 362415, 366763, 366764, 367264, 367917, 367920, 367921, 367926
PRESSURE
362374
PREVENTION
361623, 362386, 362397, 367101, 367283, 367620, 367659, 367706
PREVENTIVE MAINTENANCE
367668, 367669
PRICES
349081, 362050, 362410, 366796, 367104
PRICING
326263
PRIORITIES
361331, 361577, 362135, 362408, 367300, 367927
PROBABILISTIC ANALYSIS
361692
PROBABILITY THEORY
361670
PROBLEM DRIVER
361694, 367308, 367315

PROBLEM SOLVING
366514
PRODUCTION
318967, 362062, 367619
PRODUCTION METHODS
366787
PRODUCTIVITY
362424, 367910
PROFESSIONAL DRIVERS
366983, 367304
PROGRAMS
362367, 362368, 362370, 366782, 367268, 367302, 367306, 367620, 367911
PROJECTS
349949, 367296, 367297
PROPANE FUEL
362378
PROPERTIES
367660
PROPERTY DAMAGE
347116, 362138, 362430, 367665, 367936
PROSECUTION
367659
PROTECTION
362381, 366518, 367111
PROTECTIVE CLOTHING
367699, 367703, 367722
PROTECTIVE COATINGS
367118
PROTECTIVE EQUIPMENT
366994, 367707
PSYCHOLOGICAL ASPECTS
362397, 366513, 366990, 367917
PSYCHOMOTOR PERFORMANCE
366813, 367616, 367640
PUBLIC
362387
PUBLIC HEALTH
362387, 362393, 367268, 367661, 367689
PUBLIC INTEREST
367659
PUBLIC OPINION
362068, 362408, 367001, 367662
PUBLIC POLICY
366806, 366828, 366991, 367657
PUBLIC RELATIONS
362393
PUBLIC TRANSIT
367656
PUBLICITY
362068, 362139, 366790, 366818, 366824, 367277, 367278, 367308, 367648, 367666, 367913
PUMPING
349985, 367108
PUMPS
367288
PUNCTURE RESISTANCE
367670
PUPILS
362394
PURCHASING
362365

Q

QUALITY CONTROL
367269
QUANTIFYING
348583
QUANTITATIVE ANALYSIS
366772
QUANTITY
362424
QUESTIONNAIRES
362068, 366989

R

RACK AND PINION STEERING
366533
RADAR
326260, 367308, 367636
RADIAL TIRES
362400, 367303, 367670
RADIATORS
362403, 366787
RADIO COMMUNICATION SYSTEMS
365157, 366514
RADIO FREQUENCY INTERFERENCE
362054
RADIOACTIVE MATERIALS
361098
RAIL TRANSPORTATION
347818, 361098, 362366, 366522, 367142
RAINFALL
362415, 367117
RALLY
367114
RANDOM FUNCTIONS
361695
RATING
366537, 366822, 367098, 367104, 367105, 367312, 367929
REACTION TIME
362072, 366985
REAR AXLES
367655
REAR END COLLISIONS
318976, 361633, 361671, 362386, 367143, 367274, 367694, 367696, 367697
REAR LIGHTS
345815, 362072
REAR SEATS
366799, 366821
REAR SIGNALS
318967, 362385, 367259, 367260
REAR SUSPENSION
367655
REAR VIEW MIRRORS
318933, 362402
REAR WHEELS
367655
REBUILDING
367904, 367905
RECALL
367263, 367309, 367902
RECOMMENDATIONS
361576
RECOVERY
362074
RECREATIONAL VEHICLE
367114, 367633
RED
362385
REDUCED VISIBILITY
367622
REDUCTION
326058, 348939, 349989, 361057, 362384, 362386, 362413, 365132, 365135, 367680
REFLECTIVITY
362058
REFLECTORS
366999, 367622
REFRACTIVITY
367618
REGISTRATION FEE
349081
REGISTRATIONS
362062, 362388, 362391, 362394
REGRESSION
349261
REGRESSION ANALYSIS
349999, 361683, 364989
REGULATIONS
318502, 318933, 347138, 347695, 361624, 362048, 362055, 362408, 365132, 365135, 366820, 366971, 366972, 367002, 367090, 367105, 367272, 367307, 367310, 367924
REGULATORY REFORM
367910
REHABILITATION
349259, 362071, 362397, 367000, 367648
REINFORCED PLASTICS
367630
RELIABILITY
366765, 367301
RELIGION
367925

- REMACHINING
  - 367904
- REMOVAL
  - 361583
- REPAIR COSTS
  - 367090, 367091, 367104, 367111
- REPAIR SHOPS
  - 367099, 367104, 367111, 367674
- REPAIRING
  - 366531, 366532, 366533, 367093, 367095, 367099, 367112, 367288, 367290, 367621, 367631, 367904, 367905, 367932
- REPAIRS
  - 326433, 348376, 366766, 366780
- REPLACEABLE BULBS
  - 367107
- REPLACING
  - 367113
- REPORTING
  - 366503, 367304
- REQUIREMENTS
  - 362388, 367090
- RESEARCH
  - 348653, 361584, 366779, 366809, 367915, 367927, 367936
- RESEARCH AND DEVELOPMENT
  - 318502, 329138, 361675, 361676, 362462, 364988, 366764, 366765, 367287
- RESEARCH SAFETY VEHICLE
  - 367300
- RESIDENTIAL AREAS
  - 348583, 367632
- RESIDENTIAL BUILDINGS
  - 341118
- RESISTANCE
  - 366975, 367303
- RESOURCE ALLOCATION
  - 361693
- RESPONSE
  - 366565
- RESPONSE TIME
  - 362416, 366985
- RESPONSIBILITIES
  - 362390
- RESTRICTIONS
  - 348914
- RESUSCITATION
  - 361702
- RETIRED FROM CIRCULATION
  - 362062
- RETREAD
  - 367670
- RETRO-REFLECTORS
  - 367259, 367260
- RETROFITTING
  - 366817
- REVENUE
  - 349081, 362070
- REVIEWS
  - 318980, 326411, 349256, 361584, 362408
- RIDE SHARING
  - 362418
- RIDING QUALITY
  - 326261, 366822
- RIGHT ANGLE COLLISIONS
  - 361671
- RIGHT TURN
  - 348957, 367675
- RIGHT TURN ON RED
  - 367275
- RIGHT-OF-WAY
  - 362017
- RISK
  - 318464, 318983, 319852, 345898, 347138, 347818, 348578, 361633, 361690, 361694, 361695, 362073, 362077, 362386, 366513, 366569, 366800, 366802, 366984, 366996, 367089, 367305, 367617, 367624, 367646, 367675, 367695, 367697, 367917
- ROAD DESIGN
  - 362069
- ROAD IMPROVEMENTS
  - 367935
- ROAD MAINTENANCE
  - 367935
- ROAD SURFACES
  - 366521
- ROAD USER COSTS
  - 367930, 367933
- ROADSIDE
  - 318939, 362017
- ROADSIDE DEVELOPMENT
  - 361683
- ROBOTS
  - 366520
- ROLLING
  - 366975, 367303
- ROLLING RESISTANCE
  - 367670
- ROLLOVER ACCIDENTS
  - 362401, 367276, 367646, 367649, 367650, 367696
- ROOF CRUSH
  - 367276
- ROOFS
  - 361002, 361583, 362384
- ROUTE SIGNS
  - 348580
- ROUTES
  - 348580
- RULE MAKING
  - 367902
- RUNAWAY VEHICLES
  - 367665
- RURAL AREAS
  - 349256, 366989, 367645, 367672, 367675
- RURAL HIGHWAYS
  - 362136, 366982, 367119, 367645, 367907
- RUST PREVENTION
  - 367118
- RUSTING
  - 367093

S

- SAFE HARBOR LEASING
  - 367910
- SAFETY
  - 326261, 347695, 348583, 349949, 361098, 361624, 362365, 362384, 362386, 362409, 362410, 364847, 366516, 366809, 366825, 366972, 367001, 367002, 367095, 367117, 367260, 367264, 367293, 367298, 367299, 367309, 367310, 367311, 367312, 367637, 367662, 367676, 367679, 367902, 367932
- SAFETY BELTS
  - 318935, 318938, 318940, 318962, 341419, 345898, 349259, 361002, 361633, 361634, 361669, 362139, 362141, 362365, 362381, 364985, 364993, 366503, 366516, 366763, 366770, 366799, 366802, 366821, 366825, 366984, 366990, 367097, 367102, 367115, 367268, 367304, 367305, 367311, 367624, 367637, 367650, 367666, 367903, 367913
- SAFETY DEVICES
  - 318976, 318980, 367098, 367101, 367105
- SAFETY EDUCATION
  - 367642, 367662, 367689, 367903
- SAFETY ENGINEERING
  - 367706, 367707, 367710, 367711
- SAFETY FACTORS
  - 349535, 362050, 366980, 367722
- SAFETY FEATURES
  - 362051, 366980, 367628
- SAFETY MEASURES
  - 361577, 362131, 367101
- SAFETY PRACTICES
  - 366810, 366821, 367097, 367662, 367903
- SAFETY STANDARDS
  - 367903
- SAFETY VEHICLE
  - 326256, 326257
- SALES
  - 328908, 367910
- SALIVA
  - 366793
- SALVAGE
  - 366766
- SAMPLING
  - 367660, 367693, 367695
- SANCTIONS
  - 367308

SAVINGS
367293, 367302
SCALE MODEL
361673, 367680
SCALING
367723
SCANNING
366982
SCHOOL BUSES
362381, 367309, 367622, 367669
SCHOOL CHILD TRAFFIC SAFETY
348941, 361142, 364988
SCHOOL CROSSING PROTECTION
362058
SCHOOLS
366985
SCREENING
367301
SEALANTS
367118
SEALED BEAM HEADLIGHTS
367107
SEASONS
367117
SEATING
366979
SEATING POSITION
367697
SEATS
345898, 362381, 366822, 367644
SELECTING
361629, 362051, 366826, 367113
SELF EVALUATION
362073
SEMITRAILERS
367309, 367665
SENSITIVITY
361523
SERVICE STATIONS
367660
SERVOMECHANISMS
349988
SEVERITY
345898, 347917, 361523, 361633, 361634, 362141, 366537, 366770,
366978, 367269, 367929
SEX
362072, 362077, 366825, 367690, 367695, 367697, 367699, 367912
SHAPE
361674
SHEET MOLDING COMPOUND
366995, 367630
SHIELDING EFFECT /NOISE/
366765
SHOULDER HARNESS
366799, 367102
SHOULDER USAGE
347822
SHRINKAGE TESTS
366526
SIDE COLLISION
318501, 318515, 326038, 361673, 362383, 364993, 367100, 367143,
367269, 367311, 367637, 367696, 367697, 367698, 367708, 367718, 367719
SIDE LOOKING RADAR
366999
SIDESWIPING ACCIDENTS
367696
SIGHT DISTANCE
361331, 362415, 366502
SIGN BACKGROUND
366804, 366983
SIGN STRUCTURES
367295
SIGNALING
362069
SIGNALIZED INTERSECTIONS
361331, 361671, 362068, 366515, 367143
SIGNING
362068
SIMULATION MODELS
349138
SIMULATIONS
361673, 362419
SIMULATORS
367929
SINGLE VEHICLE ACCIDENTS
361670, 361691, 361692, 366819, 367274, 367675
SINTER /MATERIAL/
362426
SITES
361629
SIZE
361057, 367924
SKID RESISTANCE
361534
SKIDDING
362377, 364989, 367094
SKILLS
326032, 362065, 362073, 367919
SLED TESTS
364993
SLEEP
366988
SLIDING DOORS
367712
SLIP ANGLE
367655, 367682
SLIPPAGE
361672
SLOPE
362017
SLOW MOVING VEHICLES
367119
SMALL CAR
362413, 366504, 366787, 366825, 366980, 367305, 367307, 367311,
367312, 367649, 367676
SMOKE
366815
SNOW
349930, 367094
SNOW & ICE EFFECTS
366769
SNOW TIRES
362377, 366769
SNOWMOBILES
367651
SOCIAL DRINKING
367283, 367925
SOCIAL VALUES
367283
SOCIOECONOMIC ASPECTS
348583, 366989
SOCIOECONOMIC FACTORS
367283
SOCIOLOGICAL ASPECTS
362145, 366512, 366513, 366798, 366990, 366997, 367283
SODIUM HYDROXIDE
347818
SOFTWARE
367264
SOUND ABSORPTION
362427
SOURCES
367282
SPACE
349990
SPACING
345815
SPARK IGNITION ENGINES
337124, 337125, 337126, 337182, 349986, 361058, 366974, 367108
SPARK PLUGS
362053
SPARKS
362054
SPECIAL INTEREST GROUPS
367103
SPECIFIC HEAT
349985
SPECIFICATIONS
366532, 367107, 367300, 367651, 367652, 367653, 367655, 367923
SPECIFICATIONS /PERFORMANCE TYPE/
366502, 367285

SPEED
366770, 367302, 367912, 367929
SPEED CONTROL
367906
SPEED GOVERNOR
367636
SPEED LIMITS
318938, 348939, 366537, 366805, 367308, 367645, 367906
SPEED ZONES
362058
SPEEDING
367624, 367665
SPINE
366799, 367100
SPLASH AND SPRAY
367903
SPORT CARS
367285
SPRINGS /ELASTIC/
367653
STABILITY
361672
STABILITY ANALYSIS
367682
STANDARD HIGHWAY REFERENCE SYSTEM
367096
STANDARDIZATION
362058, 367689
STANDARDS
318496, 318514, 318916, 318944, 318955, 326261, 326263, 341118, 349257, 362051, 362369, 362384, 362386, 362409, 362410, 362428, 364990, 366505, 366506, 366971, 366994, 367260, 367264, 367272, 367307, 367312, 367622, 367651, 367652, 367653, 367657
STARTERS
366767
STATE GOVERNMENT
347116, 347917, 348376, 362372, 362393, 364847, 367002, 367101, 367105, 367659
STATE HIGHWAY ADMINISTRATION
367114
STATE HIGHWAYS
367930, 367933
STATE OF THE ART STUDIES
318989, 349930, 367295, 367937
STATE TRANSPORTATION DEPARTMENT
367096, 367114
STATES
318930, 362066, 362389, 362391, 366777, 366812, 366991, 367258, 367271, 367308, 367315
STATION WAGONS
367668
STATISTICAL ANALYSIS
361523, 361629, 361695, 362385, 362386, 366501, 366569, 366770, 366978
STATISTICAL METHODS
361523, 361629, 362145, 366569
STATISTICAL SAMPLING
345898, 367661
STATISTICS
326250, 326349, 329138, 361142, 361670, 362064, 362366, 362394, 362420, 362430, 366501, 366507, 366521, 366522, 366523, 366527, 367273, 367629, 367639, 367647, 367661, 367664, 367672, 367699, 367912, 367925
STATUTE CASES
366791, 367928
STEEL PIPES
349811
STEELS
367118, 367287, 367630, 367653
STEERING
362414, 362416, 366985
STEERING COLUMN
367312
STEERING CONTROL
349031, 366992, 367919
STEERING GEAR
362422, 362423, 366525
STEERING WHEEL
367683, 367693, 367695
STEREOS
366789
STIFFNESS
349989
STIMULANTS
367625
STOPPED VEHICLES
367119
STOPPING
361672
STOPPING DISTANCES
346840, 349257, 349535, 362409, 364989
STORAGE
347695
STRATEGY
318939, 326263
STRENGTH
318514
STRENGTH OF MATERIALS
362427, 367109
STRUCTURAL ANALYSIS
361675
STRUCTURAL DESIGN
326038
STUDENTS
366989
SUBCOMPACT CAR
362413, 366766
SUBJECTIVE ANALYSIS
366763, 366822
SUBMARINING
367720
SUBSIDIES
341628
SUBSTITUTION
367261, 367262
SUBSYSTEMS
362064
SUN GLARE
362058
SUPPLIERS
367910
SURFACE TEMPERATURE
349987
SURGE BRAKES
366781, 367924
SURVEYS /DATA COLLECTION/
362385, 366777, 366795, 367001, 367661, 367913
SURVIVAL
367097
SUSPENSIONS
366767
SWAYING
367623
SWITCHES
367633
SYMBOLS
347826
SYSTEMS ANALYSIS
366514, 367648

T

T INTERSECTIONS
349138
T-CARS
367905
TABLES /DATA/
362389
TANKS /CONTAINERS/
365132, 365135
TASK ANALYSIS
366992, 367919
TAX RATES
367930, 367933
TECHNOLOGICAL INNOVATION
366779
TECHNOLOGY
318939, 337124, 337125, 337126, 337182, 362412, 362413, 367270, 367287
TECHNOLOGY ASSESSMENT
366511

TECHNOLOGY TRANSFER
364988, 367689
TEENAGERS
366800, 366977, 367620, 367686, 367934
TELEPHONES
362372
TEMPERATURE LIGHT
367931
TERRAIN
362017
TEST FACILITIES
367091, 367303
TEST METHODS
326024, 326025, 349031, 361667, 362396, 362400, 366808, 366983, 366994, 367091, 367300, 367302, 367303, 367621, 367653
TEST RESULTS
326429, 362400, 366808, 366983, 367091
TEST TRACK
345894
TESTING
326429, 337124, 337125, 337126, 337182, 362409, 366507, 366811, 366994, 366999, 367280, 367680
TESTING EQUIPMENT
326024, 326025, 326070, 366505, 366506, 367112, 367314
THAWING
349930
THEFT
362049, 366527, 366797, 366997, 367659, 367909
THERMAL RESPONSE
367644
THICKNESS
349989
THORAX
367715, 367716
THREE DIMENSIONAL
367688, 367709, 367716, 367718
THREE WHEELED VEHICLES
367642
THRESHOLDS /PERCEPTION/
367916
THROTTLE BODY INJECTION SYSTEM
366775
THROTTLE TORQUE RESPONSE
366974
THRUST
367712
TILTING
349540
TIME
349138
TIME FACTOR
366514, 366982
TIME SERIES ANALYSIS
361691, 366806, 367275
TIMING
361057, 367288
TIRE GRADING SYSTEM
366971
TIRE GRIP
367670
TIRE INFLATION
326070, 362377, 367293, 367670, 367687
TIRE-PAVEMENT INTERFACE
362052, 367670, 367687
TIRES
326070, 345894, 362399, 366779, 366971, 366975, 367117, 367309, 367314, 367670, 367687, 367931
TODDLERS
367105
TOOLS
367289
TORQUE
362414
TOUGHENED WINDSHIELDS
367721
TOWING
367623, 367923
TRACKING
366999
TRACKING SYSTEMS
318931
TRACTIVE FORCES
362052
TRACTOR TRAILERS
367680, 367682
TRACTORS
366992, 366993
TRADE OFFS
326416, 337124, 337125, 337126, 337182, 366796
TRAFFIC ACCIDENT ANALYSES
366803, 366825, 367260, 367295
TRAFFIC ACCIDENT CAUSES
346840
TRAFFIC ACCIDENT ECONOMIC EFFECTS
347116, 348376
TRAFFIC ACCIDENTS
318487, 318984, 345110, 349949, 361142, 361523, 361623, 361634, 361689, 361691, 361692, 361694, 361695, 362068, 362136, 362370, 362429, 362462, 366513, 366806, 366824, 366989, 367143, 367273, 367617, 367649, 367691, 367692, 367693, 367699, 367915, 367936
TRAFFIC CONFLICTS
349138
TRAFFIC CONGESTION
361692, 362418
TRAFFIC CONTROL
348957, 361671, 362058
TRAFFIC CONTROL DEVICES
346185
TRAFFIC DELAY
348957, 362068, 366515
TRAFFIC DENSITY
362059, 362136
TRAFFIC DIVERSION
345375
TRAFFIC ENGINEERING
349952, 362060, 362418, 367275, 367658
TRAFFIC FLOW
345110, 361691, 361692, 362059, 367632
TRAFFIC FLOW SIMULATION
367937
TRAFFIC LAW ENFORCEMENT
318930, 326251, 326264, 349259, 361584, 362135, 362139, 362376, 366790, 366791, 366800, 367913
TRAFFIC LAWS
326252, 326259, 347917, 349256, 349535, 361666, 362138, 367258, 367265, 367266, 367267
TRAFFIC MANAGEMENT
362138
TRAFFIC MARKINGS
345110
TRAFFIC NOISES
341118, 366784
TRAFFIC OPERATIONS
361331
TRAFFIC POLICE
362135
TRAFFIC RECORDS
362394
TRAFFIC SAFETY
318980, 347822, 361577, 362131, 362135, 362138, 362395, 362396, 362397, 364988, 366500, 366508, 366567, 366987, 367143, 367311, 367645, 367658, 367935, 367936
TRAFFIC SAFETY EDUCATION
318935, 348941, 349259, 361142, 362075, 362139, 366802, 367298, 367299, 367634, 367911
TRAFFIC SIGN DESIGN
366982, 367929

TRAFFIC SIGNAL COORDINATION
367143
TRAFFIC SIGNAL TIMING
366504
TRAFFIC SIGNALS
345110, 346185, 348939, 361671, 362058, 362060, 367143
TRAFFIC SIGNS
345110, 361331, 361668, 366804
TRAFFIC SIMULATION MODELS
348653
TRAFFIC SPEED
345110, 362136

TRAFFIC VIOLATORS
326259, 349261, 361694, 362135, 366785, 366997, 367308, 367654
TRAFFIC VOLUME
345110, 361671, 362017, 367143, 367624, 367632, 367664
TRAFFIC WARRANTS
348583, 367275
TRAILER HITCHES
366781
TRAILERS
318976, 366781, 367114, 367309, 367623, 367922, 367924
TRAINING
367099
TRAINING AIDS
361576, 364983, 364987, 366524, 366525
TRAINS
361057
TRANQUILIZERS
367274, 367625
TRANSIENT RESPONSE
349031
TRANSMISSION
366974, 367923
TRANSPORTATION
348583, 366512, 367002
TRANSPORTATION ECONOMICS
367279
TRANSPORTATION MODELS
366828
TRANSPORTATION RESEARCH
362135, 362368
TRANSPORTATION SYSTEM MANAGEMENT
362418
TRANSPORTATION SYSTEMS
367279
TRANSVERSE MOUNTED ENGINES
366766
TRAUMA
362069, 367690, 367703, 367704, 367705, 367706, 367707, 367714, 367715, 367716, 367720
TRAVEL
362077, 367639
TRAVEL DEMAND
362418
TRAVEL TIME
348957
TREADS
362399, 367687
TREATMENT PROGRAMS
362071, 366785, 367654
TRENDS
361676, 362412, 366523, 367624, 367627, 367666
TRUCK BRAKES
366973
TRUCK DRIVERS
349990, 361140, 362414, 366972, 367260, 367308, 367665
TRUCK HIGHWAY DAMAGE
362070
TRUCK LAWS & REGULATIONS
362070, 366972
TRUCK LOAD LIMITS
362070
TRUCKING INDUSTRY
366972, 367662
TRUCKS
318501, 318515, 318976, 326261, 347818, 349138, 349257, 349811, 349990, 361098, 362366, 362402, 365132, 365135, 366524, 366525, 366537, 367259, 367260, 367302, 367309, 367630, 367650, 367662, 367669, 367670, 367696, 367903, 367907, 367929, 367930, 367933
TUBES
367652
TUNE-UPS
362057, 366810
TURN SIGNALS
362385
TURNING LIGHTS
367259, 367260
TURNING MOVEMENTS
349138, 361140
TWO DIMENSIONAL
362383, 367688
TWO LANE HIGHWAYS
367119, 367907
TWO WHEELED VEHICLES
367699, 367703, 367707
TWO-WHEELED VEHICLES
367702
TYPES
362375

U

UNDERRIDE GUARDS
318976, 361002, 367903
UNIFORM TIRE QUALITY GRADING STANDARD
366971
UNIFORM TRAFFIC LAWS
362389, 367271
UNIFORM VEHICLE CODE
362389, 362390, 362391, 367258, 367271, 367304
UNIFORMITY
362375
UNIT INJECTOR
366773
UNITED STATES GOVERNMENT
362393, 366511, 367002
UNSAFE DRIVERS
367936
UNSIGNALIZED INTERSECTIONS
349256
URBAN AREAS
318931, 326257, 349256, 361098, 366504, 367632, 367685, 367691, 367925
URBAN HIGHWAYS
362136
USED CARS
362365, 367932
USER CHARGES
341628
USER PREFERENCES
366986
USER REACTIONS
348653
UTILITY POLES
367295
UTILITY VEHICLES
362401, 366528, 367909
UTILIZATION
318935, 345898, 347917, 349259, 362051, 362139, 362141, 364985, 366503, 366516, 366801, 366802, 366984, 366990, 367268, 367666, 367911, 367913

V

VACUUM HYDRAULIC BRAKES
366781
VAL SYSTEM
367712
VALIDATION
361629
VALUES
367932
VALVES
361057, 362056, 362426, 366767
VANS
318496, 318501, 318506, 318955, 326250, 361684, 362384, 362420, 366528, 366771, 367309, 367909
VARIABLE COSTS
362410
VARIABLES
367920, 367921, 367926
VECTORS
367920, 367921, 367926
VEHICLE CHARACTERISTICS
367260
VEHICLE CLASSIFICATION
349081, 349999, 361684
VEHICLE COMPONENTS
362375, 367261, 367309, 367679
VEHICLE CONTROL
349031, 361690, 362414, 366999
VEHICLE DESIGN
318464, 318465, 318506, 318514, 318933, 318967, 318976, 326058, 326257, 326416, 341419, 361583, 361674, 361675, 361676, 362050, 362141, 362373, 362381, 362398, 362423, 366762, 366770, 366809,

366825, 367109, 367259, 367264, 367269, 367287, 367311, 367630, 367646, 367667, 367677, 367679, 367680, 367684
VEHICLE DETECTING EQUIPMENT
361684
VEHICLE DYNAMICS
366510
VEHICLE HANDLING
326024, 326025, 362401, 362423, 366510, 367642, 367655, 367681, 367682
VEHICLE IDENTIFICATION NUMBER
366797
VEHICLE INSPECTION
318487, 326433, 362375, 362421, 366782, 366810, 367114, 367293, 367313, 367314, 367662, 367668, 367669
VEHICLE LIGHTING
318967, 367259, 367260, 367281, 367622
VEHICLE MAINTENANCE
326433, 362365, 362409, 362429, 366519, 366531, 366532, 366533, 366782, 366810, 366826, 367114, 367117, 367313
VEHICLE MAKE
362062, 367909
VEHICLE OPERATING COST
341628, 366507, 367680
VEHICLE OWNERSHIP
326252
VEHICLE PERFORMANCE
318464, 318465, 318496, 318506, 326023, 326038, 328908, 349930, 361675, 362404, 362405, 362406, 362407, 366787, 367312, 367667
VEHICLE RESPONSES
366510
VEHICLE SIZE
326058, 361670, 362412, 362413, 366509, 367088, 367649, 367907
VEHICLE SPEED
318944, 326260, 345894, 348939, 349999, 361583, 364989, 367269, 367281
VEHICLE SUSPENSION SYSTEMS
362423, 366533, 367684
VEHICLE SYSTEMS
362064
VEHICLE TYPE
366528
VEHICLE WEIGHT
326058, 349081, 362373, 362379, 367261, 367262, 367291
VEHICLES
348583
VEHICULAR SAFETY
318464, 318465, 318487, 318496, 318502, 318506, 318514, 318916, 318933, 318955, 326257, 361002, 362131, 362375, 362421, 362431
VELOCITY
366504
VERY HIGH FREQUENCY
365157
VETERANS ADMINISTRATION
366976
VIBRATIONS
326069, 326261, 361675, 366767, 366783, 366816, 366822
VIDEOTAPE
348583, 348941, 366509
VIGILANCE
361690
VISCOUS FLOW
318465
VISIBILITY
326030, 345110, 345815, 361331, 362058, 367094, 367117, 367259
VISION CHARACTERISTICS
367916
VISUAL PERCEPTION
362074, 366804, 366827, 366981, 366983, 367280, 367916, 367921
VOLSKWAGEN
364985
VOLTAGE MEASUREMENT
367116
VOLTAGE REQUIREMENT
362053
VOLTMETERS
366530

W

WARNING SIGNS
345110, 366537, 366982
WARNING SYSTEMS
361690, 365157, 366985, 366988, 367119
WARRANTIES
366768, 367932
WASHING
362425, 367118
WATER PUMPS
366767
WATER TRANSPORTATION
366522, 367142
WAXES
362399, 367118
WEAR
345894, 366779, 367293, 367670, 367687
WEAR RESISTANCE
367110
WEATHER
366521
WEEDS
367282
WEIGH-IN-MOTION
362058
WEIGHING EQUIPMENT
349540
WEIGHT
318464, 318506, 318514, 318933, 326416, 326432, 349989, 366787
WEIGHT SPECIFIC SPEED
367929
WEIGHT STATIONS
362070
WEIGHTING /MATHEMATICAL/
367269
WET PAVEMENTS
361534, 367117
WHEEL ALIGNMENT
367655
WHEEL ATTACHMENTS
367109
WHEEL LOAD
349540
WHEELCHAIRS
362398
WHEELS
361672
WHIPLASH
361633, 362386, 367694
WIDTHS
367907
WIND TUNNELS
367680
WINDOW GLASS
366780
WINDSHIELD WASHERS
367117
WINDSHIELDS
318916, 318955, 362384, 367095, 367713, 367721
WINTER DRIVING
362377, 366769, 367094
WIRE
367653
WORKSHOPS /MEETINGS/
318502, 318982, 318983, 318984, 348653, 364988
WORLD
362062
WORLD HEALTH ORGANIZATION
367689

X

X RAYS
367716
X-CARS
367905

Y

YAW
361672, 367680
YELLOW PORTION /SIGNAL CYCLE/
367143
YOUNG ADULTS
367686
YOUNG DRIVERS
326032, 366806, 367624, 367627, 367649, 367663, 367675, 367934

Z

ZINC
367118